V22502

JVC

SERVICE
D. Vinoza

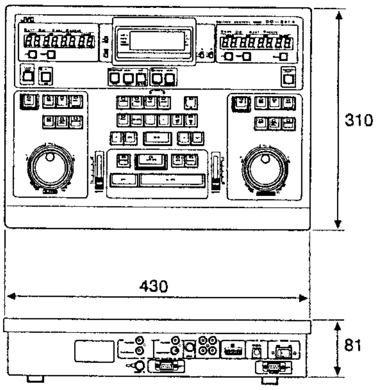
SERVICE MANUAL

AUTOMATIC EDITING CONTROL UNIT

RM-G820U

SPECIFICATIONS

- **Power supply** .... DC 9V
- **Power consumption** 8W
- **Dimensions** (W×H×D) ... 430 × 81 × 310 mm
- **Weight** 4.5Kg
- **Permissible operating temperatures 5 to 40 ° C**
- **Permissible storage temperatures –20 to 60 ° C**
- **Permissible operating humidity 30% to 80%RH**
- **VCR control operations**
  Play, Record, FF, Rewind, Still, VMC (Variable-Speed Motion Control), Program Play mode, search, eject, search ring/jog dial
- **Editing modes**
  Assemble, insert (VIDEO/Hi-Fi, AUD-1, AUD-2, TC)
- **Editing reference**
  Time code or CTL pulse
- **Orade of editing synchronization**
  - LTC/VITC time code reference, capstan bump ON: +/–0 frame
  - CTL reference, capstan bump ON: +/–2 frames (depending onVCR)
- **Preroll time**
  - Selection from 3, 5 and 7 seconds
  - Set-up menu setting from 1 to 59 seconds
- **Memory**
  - Event memory 96 events
  - Motion memory 7 events
- **Connectors**
  - 9P RS-422
    9-pin serial interface. connector.
  - SYNC IN 0.2V to 5.0Vp-p, 75 ohms, unbalanced (BNC)
  - GPI output jacks RCA X4
    Open-collector output
    Variable-timing outputs x 4. (Edit-in point +/–59 sec. 29 frames except for GPI-4 with a timing range of +/–30 frames.)
    Manual take possible
  - Audio monitor jacks
    INPUT RCA X2
    OUTPUT RCA X2
  - 10-key keypad connector
- **Display panels**
  - Time counters
    LED 8-digit.
    CTL reference operation: –9 hr. 59 min. 59 sec. 29 frames to 9 hr. 59 min. 59 sec. 29 frames, or 0 hr. 0 min. 0 sec. 0 frame to 23 h. 59 min. 59 sec. 29 frames (depending on VCR)
    Time code reference operation: 0 hr. 0 min. 0 sec. 0 frame to 23 h. 59 min. 59 sec. 29 frames
    User's bits: 00000000 to FFFFFFFF (with SMPTE time code operation)
    IN point, OUT point, duration, lap time, TOTAL time,SPLIT time, VMC speed, error message
  - LCD event display
    Event data, menu setting, error messages
- **Accessory**
  AC power adapter
  Power cord
- **Optional eccessory**
  SA-K80U (10-key keypad)
  SA-66U (Rack mount adapter)
  9PIN remete cable
- **Dimension diagram**



unit:mm

★ *Design and specifications subject to change without notice.*

No. 9309
August 1995

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded ( ) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors

5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

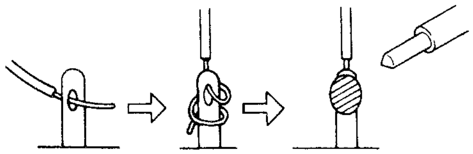


Fig. 1

6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

7. Check that replaced wires do not contact sharp edged or pointed parts.

8. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

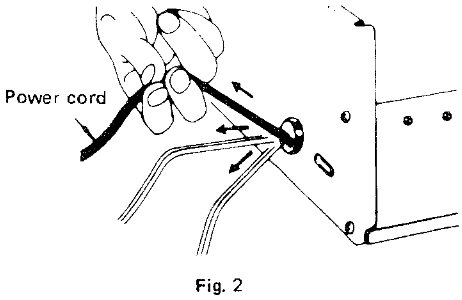


Fig. 2

9. Also check areas surrounding repaired locations.

10. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

11. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
    1) Connector part number : E03830-001
    2) **Required** tool : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

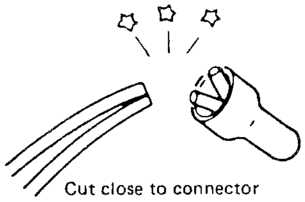


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

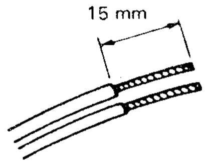


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

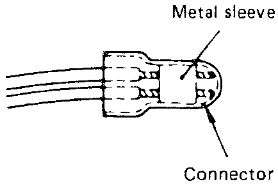


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

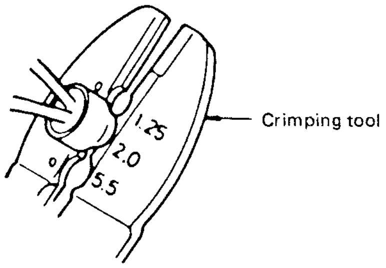


Fig. 6

(5) Check the four points noted in Fig. 7.

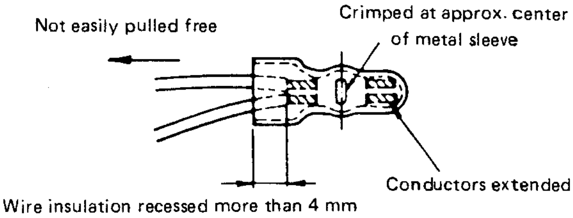

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table below.
2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). 8ee table below.
3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table below.

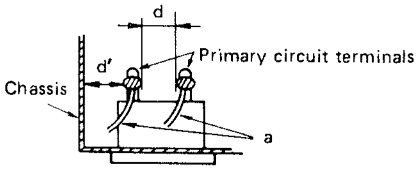


Fig. 8

4. **Leakage current test**
   Confirm specified or lower leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

   Measuring Method: (Power ON)
   Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure and following table.

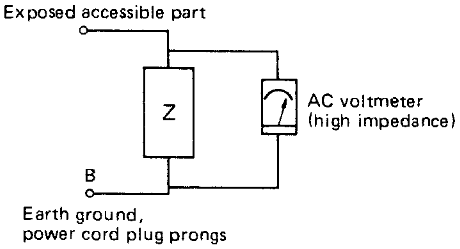


Fig. 9

AC Line Voltage	Region	Insulation Resistance	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	≧ 1 mΩ/500 V DC	1 kV 1 minute	≧ 3 mm
110 to 130 V	USA & Canada	–	900 V 1 minute	≧ 3.2 mm
*110 to 130 V 200 to 240 V	Europe Australia	≧ 10 mΩ/500 V DC	4 kV 1 minute	≧ 6 mm (d) ≧ 8 mm (d') (a: Power cord)

*Class II model only.

Table 1 Ratings for selected areas

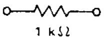
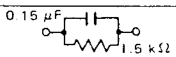
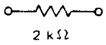
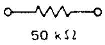
AC Line Voltage	Region	Load Z	Leakage Current (i)	Earth Ground (b) to:
100 V	Japan	 1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	 0.15 µF 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible perts
110 to 130 V 220 to 240 V	Europe Australia	 2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		 50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current ratings for selected areas

Note: This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

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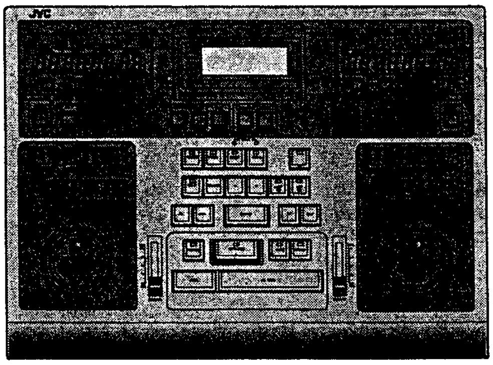
INSTRUCTIONS

JVC

RM-G820U

AUTOMATIC EDITING CONTROL UNIT



For Customsr Use:
Enter below the Serial Ne. which is located on the rear of the cabinet. Retain this inforamtion for future reference.

Model No. **RM-G820U**

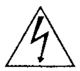
Serial No. ____________________

SL96025

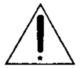
SAFETY PRECAUTIONS

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

This unit should be used with 100 to 240 V AC.

CAUTION:
To prevent electric shocks and fire hazards, do NOT use any other power source.

NOTE:
The rating plate (serial number plate) is on the rear of the unit.

INFORMATION
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

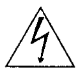
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION
CHANGES OR MODIFICATIONS NOT APPROVED BY JVC COULD VOID USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

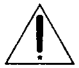
THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

ATTENTION
RISQUE D'ELECTROCUTION
NE PAS OUVRIR

ATTENTION: POUR EVITER TOUT RISQUE D'ELECTROCUTION
NE PAS OUVRIR LE BOITER.
AUCUNE PIECE INTERIEURE N'EST
A REGLER PAR L'UTILISATEUR.
SE REFERER A UN AGENT QUALIFIE EN CAS DE PROBLEME.



Le symbole de l'éclair à l'intérieur d'un triangle équilatéral est destiné à alerter l'utilisateur sur la présence d'une "tension dangereuse" non isolée dans le boîtier du produit. Cette tension est suffisante pour provoquer l'électrocution de personnes.



Le point d'exclamation à l'intérieur d'un triangle èquilatèral est destiné à alerter l'utilisateur sur la présence d'opérations d'entretien importantes au sujet desquelles des renseignements se trouvent dans le manuel d'instructions.

*Ces symboles ne sont utilisés qu'aux Etats-Unis.

AVERTISSEMENT:
POUR EVITER LES RISQUES D'INCENDIE OU D'ELECTROCUTION, NE PAS EXPOSER L'APPAREIL A L'HUMIDITE OU A LA PLUIE.

Ce unit'e ne doit être utilisé que sur 100 – 240V ∿.

ATTENTION:
Afin d'éviter tout resque d'incendie ou d'électrocution, ne pas utiliser d'autres sources d'alimentation électrique.

REMARQUE:
La plaque d'identification (numéro de série) se trouve sur le panneau arrière de l'appareil.

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le ministre des Communications.

Congratulations on your purchase of the
RM-G820U
Automatic Editing Control Unit,
and thank you for choosing JVC.

The RM-G820U Editing Control Unit is designed to work with VCRs equipped with a **9**-pin serial remote control interface and enables you to perform a variety of sophisticated editing operations.

To get the most out of your RM-G820U, take a little time to read over this manual. Written for beginners and experienced users alike, this manual contains instructions for setting up and operating the machine, as well as brief explanations of important editing techniques. While you may not need to read over every section in detail at first, we recommend that you at least look them over briefly.

Main Features

- **Variable-Speed Motion Control**
  If you have a VT (variable tracking) VCR such as the BR-S525U connected to the RM-G820U, you'll be able to perform high-quality variable-speed editing.
- **Motion Memory**
  You can manually select the player's playback speed and store the speed data in memory for later use during editing. Up to seven events can be registered and recalled as required.
- **98-Event Memory**
  You can store editing data for up to 98 separate cuts. Stored data can be used for fully automatic continuous editing (multi-event editing).
- **Four GPI Output Jacks**
  The RM-G820U is equipped with four GPI output jacks for independent delivery of effects timing instructions to a wide range of special-effects equipment.
- **Time Tracking**
  This convenient feature saves time and prevents conflicts by automatically changing the player's edit-in point whenever the recorder's edit-in point is changed.

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1. Introduction

1. General Precautions

The RM-G820U is a very sophisticated machine incorporating a variety of highly advanced technology.
For safe and reliable operation, be sure to observe the following precautions:

Safety precautions

- Always use the provided AC adapter. Do not use AC adapters other than the one provided.
- Take care not to damage the power cord as this may result in electrical leakage and create a shock hazard.
- To prevent damage to the internal circuitry, do not spill any liquids on the machine.
- Make sure that flammable, metallic, or other foreign objects do not get inside the machine.
- When not using the unit for an extended period of time, be sure to unplug the power cord from the power outlet.

What to do when something abnormal occurs

If something abnormal occurs — for example, if the unit starts emitting smoke — immediately unplug the power cord from the power outlet and contact your dealer or nearest JVC service center.

Chapter 2

Building An Editing System

Your editing system can be as simple or as complex as you like. To get started, all you need to do is connect one player and one recorder to the RM-G820U. If you want to add special effects or separately recorded audio to your edited recordings, you can connect special-effects equipment such as a video switcher or audio mixer to the provided GPI output jacks. Doing this will add a whole range of editing effects to your repertoire which you can control either manually or automatically from the RM-G820U.
In this chapter, we will show you some examples of the types of editing systems you can configure with the RM-G820U. For details on connecting different equipment, please refer to page 11.

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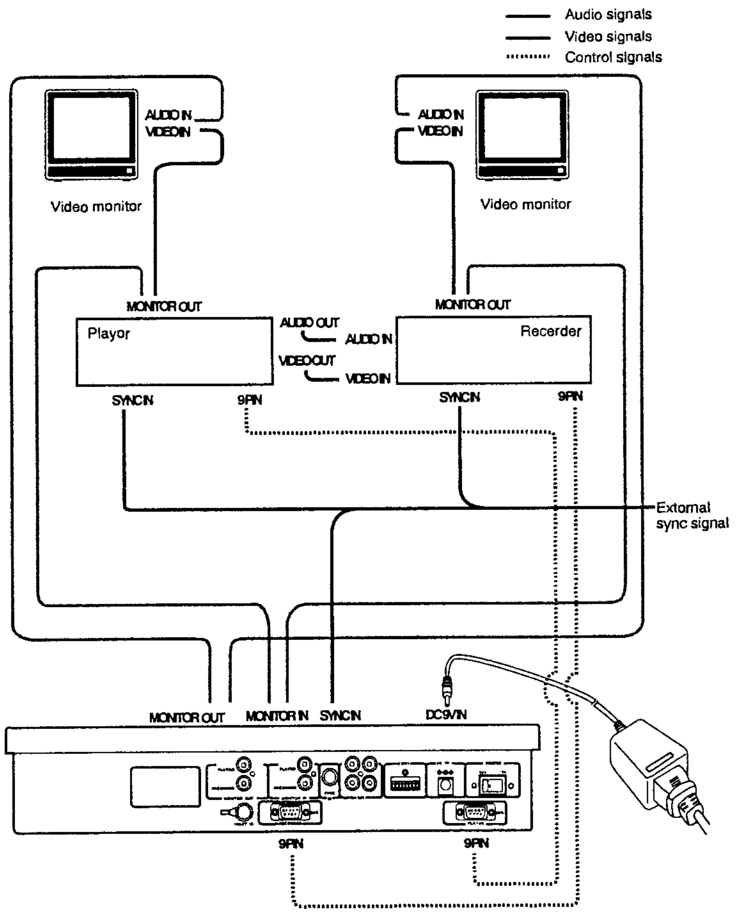
2. **Preparation** 10
3. **Connecting External Equipment** 11

2. Building An Editing System

1. Examples Of Possible System Configurations

Cuts-only editing system

This is the simplest form of basic editing system. One VCR is used as a player and another as a recorder.



Audio signals
Video signals
Control signals
AUDIO IN
VIDEO IN
Video monitor
AUDIO IN
VIDEO IN
Video monitor
MONITOR OUT
Playor
AUDIO OUT
AUDIO IN
VIDEO OUT
VIDEO IN
MONITOR OUT
Recerder
SYNC IN
9PIN
SYNC IN
9PIN
Extomal
sync signal
MONITOR OUT
MONITOR IN
SYNC IN
DC9VIN
9PIN
9PIN

To improve the level of synchronization in editing, apply an external sync signal.
When you use the RM-G820U with the SA-F911U interface unit for 9-pin to 45-pin conversion, some internal switch settings must be changed. (Refer to "EDITING SYSTEMS AND EQUIPMENT SETTIND" on page 1-5.)

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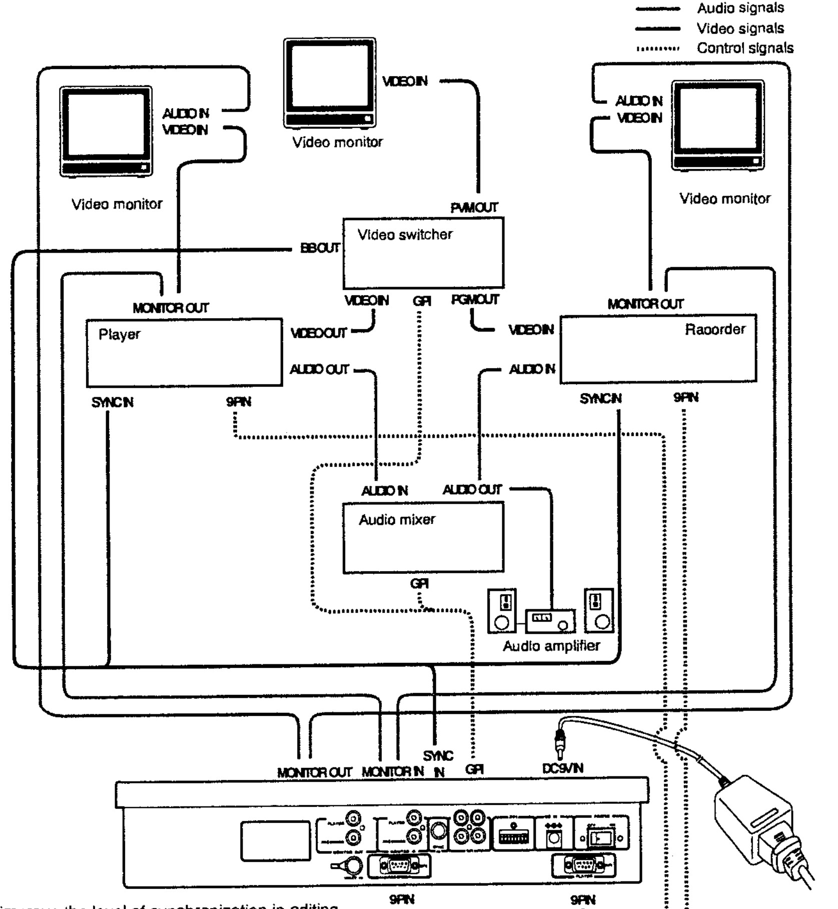
1. Examples Of Possible System Configurations

Editing system with special effects equipment (video switcher, audio mixer)

This system gives you much more control over your material. You can incorporate special effects, perform sophisticated transitions, and add new or additional audio. Thanks to the RM-G820U's GPI outputs, you'll be to control fader operation of the special-effects equipment directly from the RM-G820U.



Audio signals
Video signals
Control signals
AUDIO IN
VIDEO IN
Video monitor
VIDEO IN
Video monitor
AUDIO IN
VIDEO IN
Video monitor
PVM OUT
Video switcher
BB OUT
VIDEO IN
GPI
PGM OUT
MONITOR OUT
Player
VIDEO OUT
AUDIO OUT
VIDEO IN
AUDIO IN
MONITOR OUT
Raoorder
SYNC IN
9PIN
SYNC IN
9PIN
AUDIO IN
AUDIO OUT
Audio mixer
GPI
Audio amplifier
MONITOR OUT
MONITOR IN
SYNC IN
GPI
DC9VIN
9PIN
9PIN

To improve the level cf synchronization in editing, apply an external syno signal.
When you use the RM-G820U with the SA-F911U interface unit for 9-pin to 45-pin conversion, some internal switch settings must be changed. (Refer to "EDITING SYSTMS AND EQUIPMENT SETTING" on page 1-5.)

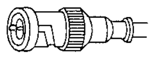
2. Preparation

Connection cables

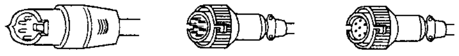
Make sure you have all the cables necessary to connect the equipment required for your system.

■ Video signal connection cables

BNC cables

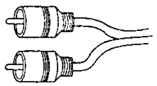


cr Y/C cables

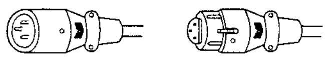


■ Audio signal connection cables

RCA cables

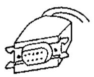


or Cannon cables



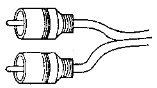
■ Remote control cables

9-pin D-SUB connector cables



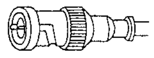
■ GPI signal connection cables

RCA cables



■ External syne signal connection cables

BNC cables



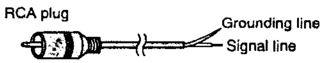
■ Power supply oables

Power shculd be supplied to the RM-G820U through the provided AC adapter.

In some cases, you may have to modify the cable connector to properly match the connectcrs on the equipment yeu're connecting it to. Check the connectors on your equipment and modify the cable connectors accordingly.

Example: Modifying an RCA oable for GPI connectlon with the KM-D600U and slmilar unlts

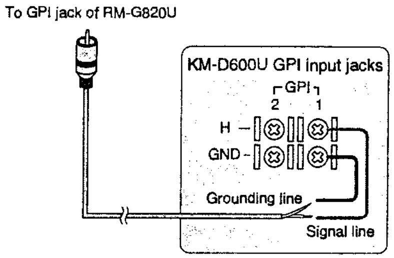
Cut one end of tho RCA cablo and separate it into a grounding line and signal line as shown on the right.



3. Connecting External Equipment

Connecting special-effects equipment to the GPI jacks

- Example shows KM-D500U connection

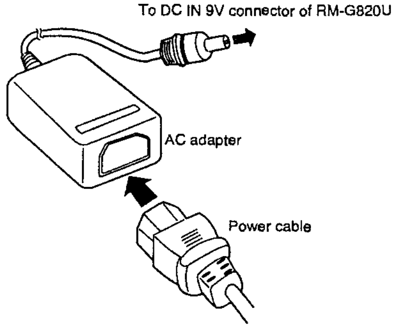


Connect the signal line to the H (Hot) terminal and the grounding line to the GND (Grounding) terminal.

A-roll editing cannot be performed with the KM-D600U. (Refer to "A-roll Editing" on page 55.)

Connecting the provided AC adapter

1. Insert the AC adapter's DC output plug intc the RM-G820U's DC 9V IN connector.
2. Plug the power cable into the AC adapter's AC IN connector.



Handling preoautlons

- The AC adapter is an inlet-type adapter. Use an approved 3-wire grounding power cord with a nominal cross section of 0.75 mm² or more. This is a safety feature. Be sure that the cable you use matches the safety standards adopted in your country.
- The adapter's rated input voltage is 100 to 240 V AC. No switching or transformers to match local voltage are required.
- Unplug the power cord from the AC outlet when you're not using the RM-G820U.
- This equipment contains high voltage parts. Never attempt to open this equipment.

Input/output ratlng

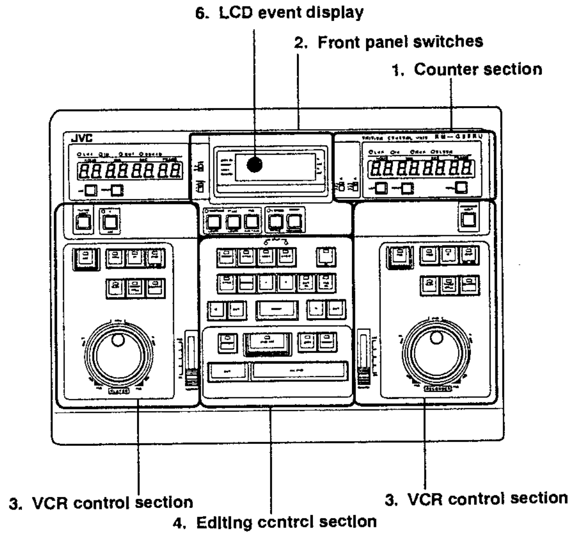
Input		Output	
AC voltage (V)	Frequency (Hz)	DC voltage (V)	Current (A)
100-240	50/60	+9	2.0

- This AC adapter is an equivalent product to the AC adapter (model SWA0902W) manufactured by Tamura Electric Works, Ltd.

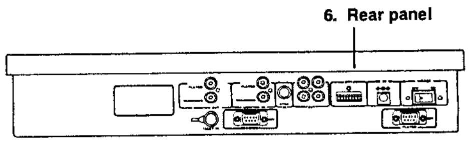
Chapter 3
Controls, Connectors And Indicators

Read this chapter for information on the names and functions of the RM-G820U's controls, connectors and indicators. These are grouped into sections as shown below.

1. **Counter Section** 14
2. **Front Panel Switches** 16
3. **VCR Control Section** 18
4. **Editing Control Section** 20
5. **LCD Event Display** 22
6. **Rear Panel** 23



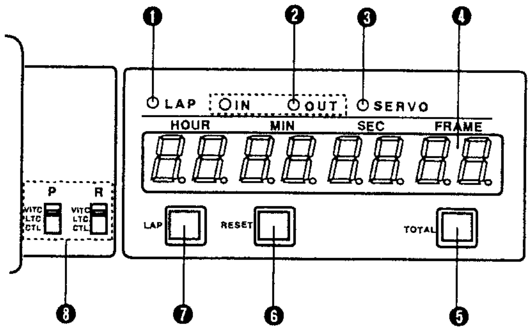
6. LCD event display
2. Front panel switches
1. Counter section
JVC
3. VCR control section
4. Editing control section
3. VCR control section

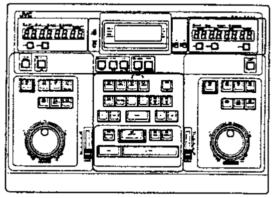


6. Rear panel

3. Controls, Connoctors And Indiators

1. Counter Section





① [LAP] Lap indicator
Lights when LAP display button ⑦ is pressed to engage the lap mode.

② [IN/OUT] Edit in/out point indicators
These indicators light when the player's edit points are registered.

When IN is lit : The edit-in point has been registered.

When OUT is lit : The edit-out point has been registered.

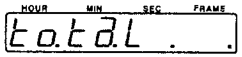
③ [SERVO] Servo lock indicator
Lights when the drum servo and capstan servo are locked.

④ Time ccunter display
Displays tape position data in hours, minutes, seconds and frame numbers. The type of time data displayed can be switched with the time counter select switches.
The following information can also be displayed when required:

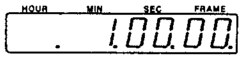
- Edit-in point, edit-out point, duration
- Lap time
- Play speed
- Audio split time
- Numeric input data
- Error messages

⑤ [TOTAL] Total button **Recorder side only**
When this button is held down, the tape position corresponding to the program start time is displayed in the time counter.

Plsyer side



Recorder side



- To set the program start time, press the RESET button while pressing the TOTAL button. In this case, the total time is reset.
- If the edit-in point is set as the program start time, the edit total time can be checked.
- Press the total button and the IN key cn the recorder side simultaneously to check the program start time.
- To access the tape position corresponding to the program start time, press the GOTO key while pressing the TOTAL button.
- When the rear-panel DIP switches 1 - 6 are set to ON, pressing the TOTAL button while pressing the SHIFT key sets the EDL event data print-out mode.

1. Counter Section

⑥ [RESET] Time counter reset button
Press to reset the time data displayed on the time counter. The display is reset to 0:00:00:00.

- Time data is not reset if time code data is displayed when you press this button.
- If the LAP indicator is lit when you press this button, the lap time data will be reset.
- Registered edit points are canceled when this button is pressed.

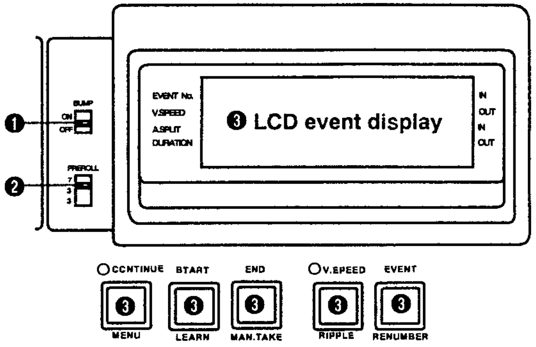
⑦ [LAP] Lap display button
Press this button to display elapsed time from the last registered edit-in point to the current tape position. The LAP indicator lights and the lap time is displayed on the time counter display. Press again to cancel the display and turn the LAP indicator off.

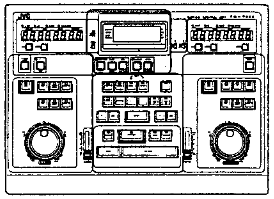
⑧ Time counter select switches
Use these switches to select the timer mode (time counter reading reference). Panel indication [P] stands for "Player" and [R] stands for "Recorder".

[VITC] : To read VITC data. This data cannot be reset with the RESET button.
[LTC] : To read LTC data. This data cannot be reset with the RESET button.
[CTL] : To read CTL data. This data can be reset with the RESET button.

Use the same timer mode setting for the RM-G820U and the VCRs. The VCR's on-screen display may be different from the time counter display of this unit.

2. Front Panel Switches





❷ [BUMP] BUMP ON/OFF switch

Press to switch BUMP ON/OFF.

[ON] : Use this setting when high editing accuracy is required. Note that BUMP cannot be activated unless the preroll time is set to 5 seconds or more. Normally set to this position.
Preroll time — Refer to page 29.

[OFF] : BUMP is defeated.
Set to this position when editing does not start after retries.

❷ [PREROLL] Preroll time eetting switch

Use this switch to set the preroll time, which can be selected from 3 seconds, 5 seconds and 7 seconds. The preroll time can also be set via a set-up menu.
(Refer to "Configuring The RM-G820U" on page 37.)

Buttons ❷ through ❷ are dual-function buttons. To use the function indicated above the button, simply press the button. To use the function indicated below the button, press the button while pressing the SHIFT key.

❷ [CONTINUE]/[MENU] Continue/Menu button

[CONTINUE] : Press this button for multi-event editing. The CONTINUE indicator lights at this time. Press the button again to return to normal editing.

[MENU] : When you need to set items in the set-up menu, press this button while pressing the SHIFT key. The menu is displayed on the LCD event display. To return to the previous display, press the ALL STOP key. (Refer to "Configuring The RM-G820U" on page 87.)

2. Front Panel Switches

❷ [START]/[LEARN] Start/Learn button

[START] : Press this button to specify the start event in multi-event editing. (Refer to "Multi-Event Editing" on page 56.)

[LEARN] : To set the optimum editing timing of the connected VCR, press this button while pressing the SHIFT key. Be sure to execute this function each time you change a connected VCR.(Refer to "Preparing the editing system" on page 28.)

❷ [END]/[MAN.TAKE] End/Manual take button

[END] : Press this button to specify the last event in multi-event editing.
(Refer to "Multi-Event Editing" on page 56.)

[MAN.TAKE] : To manually change pre-set effects on connected special effects equipment (video switcher or audio mixer), press this button while pressing the SHIFT key.
(Refer to "Operating Special Effects Equipment" on page 54.)

❷ [V.SPEED]/[RIPPLE] Variable speed/Ripple button

[V.SPEED] : Press this button to set the player playback speed during automatic editing. The indicator lights when this is pressed. To cancel the set speed, press this button and the CANCEL key simultaneously. (Refer to "Variable-Speed Motion Control" on page 57.)

[RIPPLE] : Press this button while pressing the SHIFT key to convert the recorder time data registered in the event memory into continuous data.
(Refer to "Processing Event Data" on page 50.)

❷ [EVENT]/[RENUMBER] Event/Renumber button

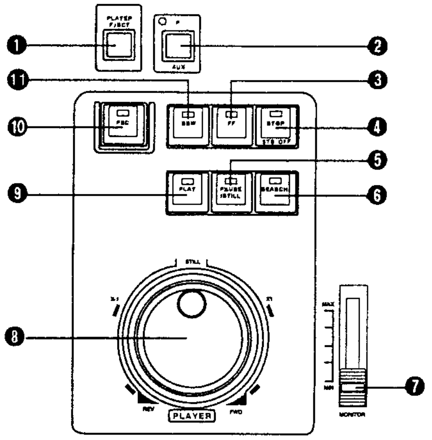
[EVENT] : Press this button to recall an event number which has been registered in the event memory. (Refer to "Recalling event data" on page 49.)

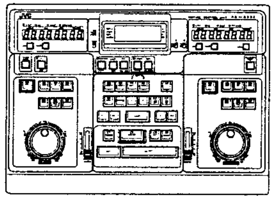
[RENUMBER] : When event numbers in the event memory become discontinuous after deletion of some registered events, press this button while pressing the SHIFT key to renumber the events consecutively. (Refer to "Processing Event Data" on page 50.)

❸ LCD event display

Shows event data, set-up menus and error messages. (Refer to "LCD Event Display" on page 22.)

3. VCR Control Section



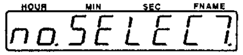


Key layout is identical on both the player and recorder control sides, except that the P/AUX key ❷ is only provided on the player control side.

❶ [EJECT] Cassette eject button
Press to eject the cassette in the VCR.

❷ [P/AUX] Player/AUX button (Player side only)
This button is used to select the editing source.
[P] : Press this button to select and control the player. The indicator above the button lights when this is pressed.
[AUX] : When editing on the recorder alone without using the player, press this button while holding the SHIFT key depressed. In this condition, the time counter shows "NO SELECT" and the player VCR cannot be controlled.

NO SELECT indication



❸ [FF] Fast forward key
Press to fast-forward the tape.

❹ [STOP/STB OFF] Stop/Standby off key
[STOP] : Press this key to stop the VCR.
[STB OFF] : To engage the standby off mode, press this key while pressing the SHIFT key. Standby off can only be engaged when the VCR is in the stop mode. You can also engage the standby off mode by pressing the PAUSE/STILL key while pressing this key.

❺ [PAUSE/STILL] Pause/Still key
Press to pause tape temporarily during play. To resume play, press the PLAY key. Pressing this key in the stop mode while pressing the STOP key engages the standby off mode.

❻ [SEARCH/VAR] Search/Variable key
[SEARCH] : Press this key to play the tape at the speed set with the search ring.
[VAR] : To engage the variable-speed search mode, press this key while pressing the SHIFT key. This mode can be canceled by pressing any of the FF, REW, STOP, SEARCH and ALL STOP keys. (Refer to "Variable-speed search mode" on page 31.)

3. VCR Control Section

❼ [MONITOR] Audio monitor level control
Use to adjust the level of the audio signal being monitored.

❽ Search ring/Jog dial
[Search ring] : Rotate the outer ring for search playback. Search speed and direction vary according to how far and in which direction the ring is rotated.

> When the power switch is set to ON, the rotating angle of the search dial may not match the VCR's search speed. In this case, rotate the search dial once to the right and to the left.

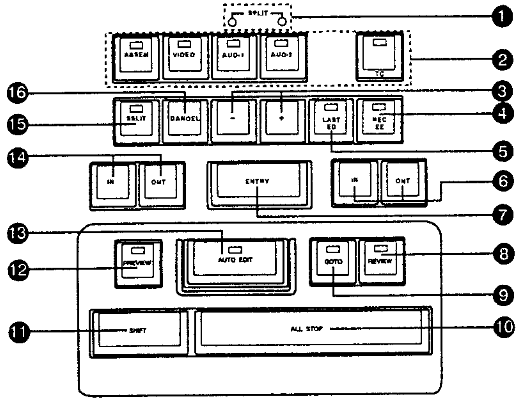
[Jog dial] : Rotate the inner dial for frame-by-frame search. Jog speed (up to +/– 1x speed) and direction vary according to how quickly and in which direction the dial is turned. The recorder's jog dial is also used when changing edit points or selecting items in the set-up menus.
(Refer to "Remote Control Of VCRs" on page 30.)
(Refer to "Configuring The RM-G820U" on page 37.)

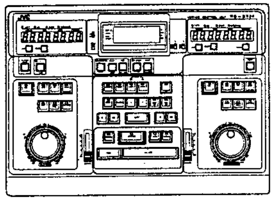
❾ [PLAY] Play key
- Press this key to start tape playback.
- To record all input signals (video, audio 1/2, time code and CTL), press this key while pressing the REC key.
- To engage the program play mode, press the player's PLAY key while pressing the SHIFT key.In this case, the set-up menu settings must be changed. (Refer to "Program Play Mode" on page 74.)

❿ [REC] Record key
- To record all input signals (video, audio 1/2, time code and CTL), press the PLAY key while pressing this key.
- Press this key on its own during playback to check the signals being input to the VCR.

⓫ [REW] Rewind key
Press to rewind the tape.

4. Editing Control Section





❶ [SPLIT] Audio-split indicators
When audio has been selected for insertion in the audio-split editing mode, the corresponding indicator lights.

❷ Editing mode select keys
Press one of these keys to select the assemble editing or insert editing mode. The indicator on the selected key lights. Pressing the same key again cancels the selection.

Assemble editing
[ASSEM] : Press to engage the assemble editing mode. All input signals (video, audio 1/2, time code and CTL) are recorded in this mode.

Insert editing
[VIDEO] : Press to select the video insert mode.
[AUD-1] : Press to select the normal audio L (Leff) CH insert mode.
[AUD-2] : Press to select the normal audio R (Right) CH insert mode.
[TC]: To select the time code insert mode, press this button while holding the SHIFT key depressed. Both LTC and CTL time codes can be recorded in this mode, but CTL time code recording is only possible when using the BR-S800U Recorder. Hold the TC button down to display user bits. (Refer to "Preset time code / user bits" on page 72.)

❸ [+]/[–] Plus/Minus keys
Use these keys to change a registered edit point or numeric data in the set-up menus. These keys are also used when simultaneously registering, clearing, displaying or searching both the player's and the recorder's edit points. (Refer to "Other Functions" on page 84.)
These keys are also used to select the print-out format when printing out event data.

❹ [REC EE] REC EE key
- Press to check video and audio signal input (to the recorder) on the monitor.
- Press again to oancel EE monitoring. This mode is automatically canceled when preview, editing or review starts.
- Press this key while pressing the SHIFT key to preset time codes. In this case, the rear-panel DIP switch settings must be changed.(Refer to "Preset time code / user bits" on page 72.)

❺ [LAST ED] Last edit key
- Press to display the edit data stored in the last edit buffer memory. Pressing the button again restores the current editing data display.
- The last edit buffer stores the edit data that has just been executed. (Refer to "Recalling the last edit" on page 49.)
- Press this key while pressing the SHIFT koy to preset the user bits. In this case, the rear-panel DIP switch settings must be changed.(Refer to "Preset time code / user bits" on page 72.)

4. Editing Control Section

❻ [IN]/[OUT] In/Out keys
- Use these keys when registering, displaying, clearing, changing or searching the recorder's edit points or when displaying or changing the duration.
- Pressing the recorder and player IN keys simultaneously engages the manual time tracking mode. (Refer to "Manual time tracking" on page 65.)

❼ [ENTRY] Entry key
Press when registering an edit point or entering set-up menu data in memory.
(Refer to "Registering edit points" on page 33.)
(Refer to "Configuring The RM-G820U" on page 37.)

❽ [REVIEW] Review key
- Press to check edits after editing.
- Press this key while pressing the SHIFT key to review the scene near the edit-out point. (Refer to "Review" on page 36.)
- You can check the player playback speed control data stored in memory when editing with the motion memory.(Refer to "Variable-Speed Motion Control" on page 57.)

❾ [GOTO] Go-to key
Press to access a specified tape position — an edit point, for example. (Refer to "GOTO (Quick search" on page 84.)

❿ [ALL STOP] All stop key
- Press to stop both the player and recorder. Editing stops when this key is pressed during editing. (Refer to "Actual editing" on page 88.)
- Pressing this key while a set-up menu is displayed returns the displayed information to the event data display. (Refer to "Configuring The RM-G820U" on page 37.)
If you press this key while an error message is displayed, the event data display will be restored.

⓫ [SHIFT] Shift key
This key activates secondary functions of dual-function keys. Keep this key pressed and press the appropriate key to engage the desired function.
The SHIFT key is also used in other applied functions described elsewhere.

⓬ [PREVIEW] Preview key
- Press to start preview (rehearsal) editing.
- Pressing this key while pressing the SHIFT key lets you preview the scene near the edit-out point.

⓭ [AUTO EDIT] Auto edit key
- Press this key to execute actual editing.
- Press this key while pressing the SHIFT key to register the editing data in the EDL memory (editing is not executed).
- Editing stops when this key is pressed during actual editing. (Refer to "Actual Editing" on page 36.)

⓮ [IN]/[OUT] In/Out keys
- Use these keys when registering, displaying, clearing, changing or searching the player's edit points or when displaying or changing the duration.
- Pressing the recorder and player IN keys simultaneously engages the manual time tracking mode. (Refer to "Manual time tracking" on page 65.)

⓯ [SPLIT] Audio-split editing key
Use this key when setting the audio edit-in point (split timing) in audio-split editing.
(Refer to "Audio-Split Editing" on page 60.).

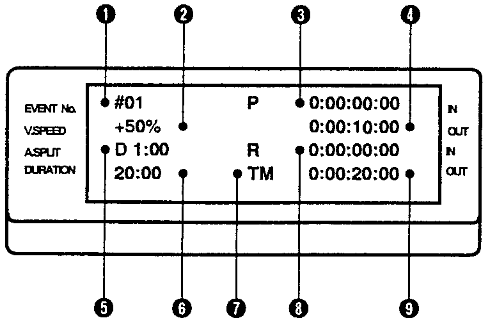
⓰ [CANCEL] Cancel key
To cancel a registered event or data, press CANCEL while pressing the corresponding key. Data cancellation methods are described elsewhere.

5. LCD Event Display

The LCD event display shows entered event data, as well as the set-up menus and error messages.
(Refer to "Configuring The RM-G820U" on page 37 and "Error Messages" on page 78.)

Display example

Note:
The display pictured here is only an example and differs from the actual display.



① **[EVENT No.] Event number display**
Displays the number assigned to each event.
During multi-event editing, displays the edit event range.
When the event being displayed is the last event, "NEW" is displayed before the number. (Refer to "Multi-Event Editing" on page 56.)

② **[V.SPEED] VMC speed display**
When the V.SPEED button is pressed, this display shows the speed set for the player. Speed is shown in percentages. When the motion memory is in use, this display shows the remaining capacity.
(Refer to "Variable-Speed Motion Control" on page 57.)

③ **[IN] Player edit-IN point display**
Displays the player's edit-in point.

④ **[OUT] Player edit-OUT point display**
Displays the player's edit-out point.

⑤ **[A.SPLIT] Audio-split time display**
During audio-split editing, this displays the timing of the normal audio edit-in point. When V.SPEED is displayed, this display shows player duration.
(Refer to "Audio-Split Editing" on page 60.)

⑥ **[DURATION] Duration display**
Displays edit duration from the edit-in point to the edit-out point for either the player or recorder. Hour units are not displayed. Minute and seconds are not separated by a colon (:) if the displayed duration exceeds one minute.

⑦ **Time tracking mode indicator**
"TM" is displayed in the time tracking mode.
(Refer to "Manual time tracking" on page 85.)

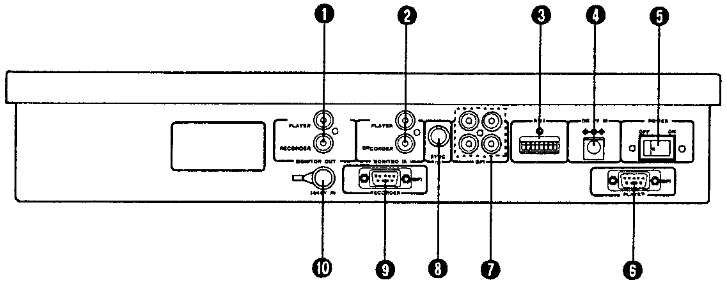
⑧ **[IN] Recorder edit-IN point display**
Displays the recorder's edit-in point.

⑨ **[OUT] Recorder edit-OUT point display**
Displays the recorder's edit-out point.

The drop frame mode and non drop-frame mode are indicated on the edit-point display with a semicolon (;) and a colon (:), respectively.

Edit point display
Non-drop frame mode
00:00:00:00
Drop-frame mode
00;00;00;00

6. Rear Panel



① **[MONITOR OUT] Monitor output jacks (RCA)**
Connect these outputs to the input jacks of an audio monitor. The output level can be varied with the audio level volume control on the front panel. Two jacks are provided for separate player and recorder monitoring.

② **[MONITOR IN] Monitor input jacks (RCA)**
Connect the audio monitor output jacks of the player and recorder to these jacks. Two jacks are provided for separate player and recorder monitoring.

③ **[SW1] DIP switch 1**
Use this switch in the set-up operation. (Refer to "Rear-Panel DIP Switches" on page 44.)

④ **[DC 9V IN] DC power input connector**
Connect the provided AC adapter cable here.

⑤ **[POWER ON/OFF] Power switch**
Power supply ON/OFF switch.

⑥ **[PLAYER] 9-pin remote control connector (D-SUB 9P)**
An RS-422 serial interface connector for remote control of the player.

⑦ **[GPI1 - 4] GPI 1 - 4 output jack (RCA)**
Connect to the GPI input jacks of a video switcher, audio mixer, etc. These jacks output the GPI pulse for special effects switching. GPI 1 - 3 output jacks always output GPI signals at the set timing when editing. For the GPI 4 output jack, GPI output can be set to OFF using the set-up menu 08 [CPI SET-4].

⑧ **[SYNC IN] Sync signal input connector (BNC)**
The reference signal for the editing system is input here. Apply a composite sync video signal.

⑨ **[RECORDER] 9-pin remote control connector (D-SUB 9P)**
An RS-422 serial interface connector for remote control of the recorder.

⑩ **[10KEY IN] 10-key keypad connection terminal**
Connect the optional SA-K80U 10-key keypad here. The 10-key keypad is necessary to set the playback speed in the program play mode and to preset user bits. (Refer to "Program Play Mode" on page 74 and "Preset time Code /user bits" on page 72.)

Chapter 4
Editing Operations

This chapter provides detailed step-by-step descriptions of basic editing operations. If you are new to editing, you should read the entire chapter in the order the material is presented in order to fully understand editing procedures. If you are already familiar with standard editing techniques, you need only read the pertinent sections. For instructions on how to use connected equipment, please read the appropriate manuals.

1. **Preparation** 26
2. **Remote Control Of VCRs** 30
3. **Basic Editing** 32

4. Editing Operatiens

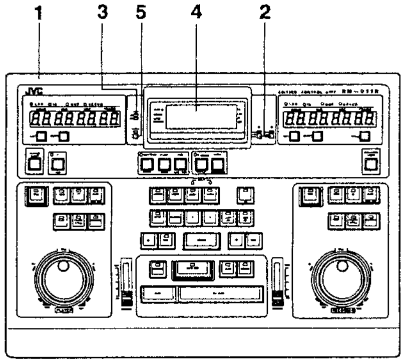
1. Preparation

Follow the instructions in this section when preparing to use a basic CTL time code editing system consisting of one player and one recorder. For information on other possible editing techniques, refer to Chapter 7 "Advanced Editing Operations".

Preparing the VCRs

1. Set the POWER switches to ON.
2. Set the REMOTE/LOCAL switches to the 9-Pin REMOTE side.
3. Load cassette tapes.
4. Set the player properly and adjust the required items (tracking, audio play level, etc.).
5. Set the recorder properly (input select switch, etc.) and adjust the required items (video and audio recording levels).
8. Set the time counter select switches to CTL.

Preparing the RM-G820U



1. Set the POWER switch to ON.
2. Select the CTL signal as the time code reference signal for the player and recorder. Set both time counter select switches to "CTL". The timer mode setting should be the same for this unit and the VCR. The on-screen display of the VCR may be different from the time counter display of this unit.
3. Set the BUMP switch as required. Set to "ON" for more accurate editing. When the BUMP switch is set to ON, you can select the VCR whose phase is to be modified. When shipped, BUMP SELECT is set to RECORDER. Set to OFF when using a VCR to which phase modification cannot be applied.
   When an EP-recorded tape is used as the source, select the recorder.
4. Set the edit timing.
   When setting set-up menu 01 "EDIT TIMING", match the edit timing with that set on the VCR.
   If the BR-S800U or BR-S822U is connected to this unit, edit timing is automatically set when the VCR's "9FIN DEVICE TYPE ID" is set to JVC S-VHS-1. However, be sure to change the edit timing each time the VCR's edit timing is changed.
5. Set the preroll time. The preroll time can be set with the PREROLL switch or via a set-up menu. If the BUMP switch is set to ON, the preroll time should be set to 5 seconds or more. (Refer to "Configuring The RM-G820U" on page 38.)

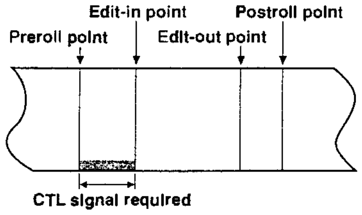
1. Preparation

Preparing the recording (editing master) tape

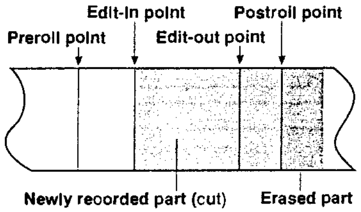
This applies to both the assemble and insert editing modes.

Assemble editing

Before starting to edit on a new (non-recorded) tape, you must record a CTL signal at the beginning of the tape before the first edit-in point. The length of this CTL-recorded portion must exceed the preroll time.

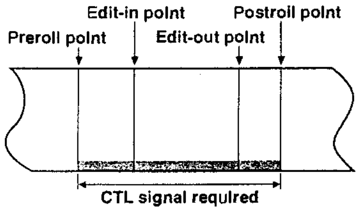


How signals are recorded in assemble editing
New video, audio, time code and CTL signals are recorded across the entire width of the tape. Previously recorded information is erased. Previously recorded material that follows the edit-out point is not erased, resulting in some picture disturbance at this point. For best results, you should erase the entire tape prior to assemble editing.

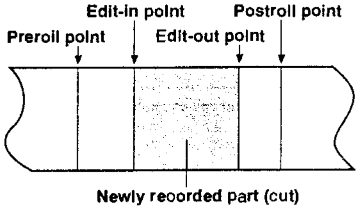


Inssrt editing

You cannot execute insert editing if the CTL signal has not been recorded continuously throughout the portion of tape where you plan to insert the new recording. If this is the case, then you have to record a CTL signal before you can start editing. The length of this CTL-recorded portion must exceed the length of the planned edit.



How signals are recorded in Insert editing
Signals (video, audio, time code) can be selected separately and recorded. This new material can be inserted within a previously recorded scene without picture disturbance at the edit points.



How to record the CTL signal

1. Input a stable video signal from a camera or signal generator to the recorder.
2. Engage the record mode. Press the recorder's REC and PLAY keys simultaneously.
3. After recording the CTL signal for the required period, stop the VCR by pressing the STOP key.

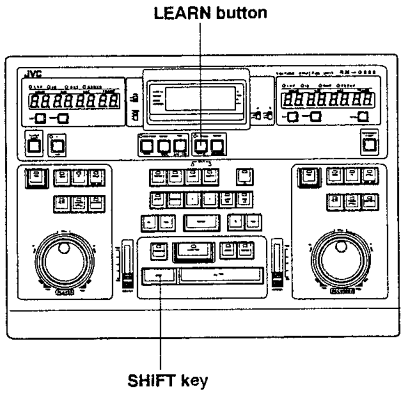
Notes regarding tha EP mode (3x mode)
When using a VCR (BR-S800U/BR-S500U) which allows playback in the EP mode, keep the following points in mind.

- When the BUMP switch is set to ON, set set-up menu 18 "BUMP SELECT" to RECORDER.
- Set the player's time counter switch to CTL. When an EP-recorded tape is read in the time code mode, the time variation increases in the FF or REW mode.

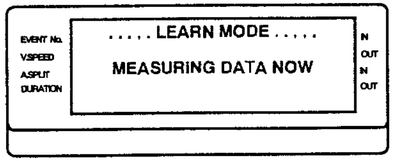
1. Preparation

Proparing the editing system

1. Activate the learning function.
   Insert recorded tapes in the player and recorder and press the LEARN button while pressing the SHIFT key of the RM-G820U. A message indicating that the learn mode has been ongaged appears on the LCD event display, and the VCRs start up automatically to allow the RM-G820U to measure startup time.



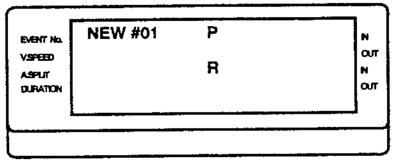
LCD event display



During measurement

When measurement is complete, the original information on the LCD event display is restcred and the VCRs enter the still mode. This cperation is required whenever one (or both) of the connected VCRs is changed.

Example



After measurement

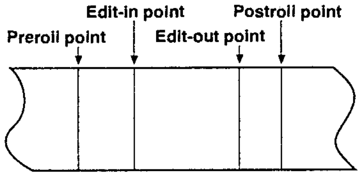
Learning function

This function automatically measures the startup times (pinch on delay time) of the recorder and player. The measured values are used during editing to facilitate phase modification and tho preroll time can be shortened.

1. Preparation

Preroll

To ensure that the source image is stable when recording starts, playback is started slightly before the specified edit-in point. This means that the tape has to be rewound — an operation referred to as prerolling. The preroll time can be set with the PREROLL switch or via the set-up menu 01 "PREROLL TIME". (Refer to "Set-Up Menu Switch Setting" on page 38.)



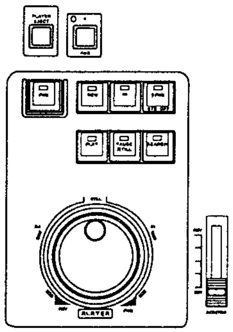
Postroll

After actual editing or preview editing, the tape is transported slightly past the edit-out point — an operation called postrolling. Postrolling makes it easier to check the results of a cut and simplifies designation of the next edit-in point. The postroll time for actual editing is fixed at 1 second. The postroll time for preview and review can be set to whatever time is suitable for checking the cut. To do this, use the sot-up menu 01 "POSTROLL TIME". (Refer to "Set-Up Menu Switch Setting" on page 38.) The postroll time for preview and review of assemblo editing is set to 1 sec.

Preview : Refer to page 34.
Review : Refer to page 36.

2. Remote Control Of VCRs

You can control VCR tape transport operations with the keys and Jog/Search controls in the VCR control section. The VCR control section is divided into separate player and recorder sections, but the keys and controls are identical on both sides.

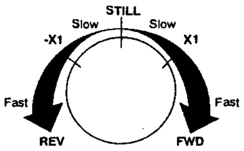


Control key	Operation
PLAY key	Playback
FF key	Fast Forward
REW key	Rewind
STOP key	Stop
PAUSE/STILL key	STILL
SEARCH key	Search playback at the speed set with the search ring position
Pressing REC and PLAY keys simultaneously	Record
Pressing STOP key while pressing SHIFT key	Standby off
Pressing SEARCH key while pressing SHIFT key	Variable-speed search

Search ring
The search direction is determined by the direction in which the ring is turned.

STILL position	Pause
Toward REV	Reverse search
Toward FWD	Forward search

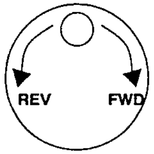
The search speed is determined by the angle of rotation. The greater the angle, the higher the speed.



Jog dial
Tape direction is determined by the direction in which the dial is turned.

Clockwise	Forward jog
Counterclockwise	Reverse jog

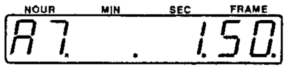
Jog speed is determined by the speed with which the dial is rotated. Maximum jog speed is 1x.



2. Remote Control Of VCRs

Standby off and standby on
When the STOP key is pressed while holding the SHIFT key depressed in the stop mode, the corresponding VCR enters the standby off mode.
If you expect a fairly lengthy delay before editing continues, you should engage the Standby Off mode as this will protect the tape by stopping the rotary head and releasing the pinch rollers. On the other hand, it takes longer to re-start VCR operation from this mode and the CTL count is less accurate. During editing, the VCRs remain in the Standby On mode so that they can start up more quickly.

Variable-speed search mode
Noise-free search is available when you use a VT-capable VCR (BR-S525U, etc.). Search speed can be varied from –2x to +3x. During variable-speed search, the time counter shows the playback speed in percentages.



1.5x (150%) speed

To cancel the variable-speed search mode, press any of these keys: FF, REW, STOP, SEARCH or ALL STOP.

Stopping VCR tape transport
Tape transport operations can be stopped by pressing the STOP key, the PAUSE/STILL key or the ALL STOP key. However, while the apparent effect of pressing these keys is identical — i.e. the tape in the VCR stops — the actual effect may vary because different commands are sent from the RM-G820U.

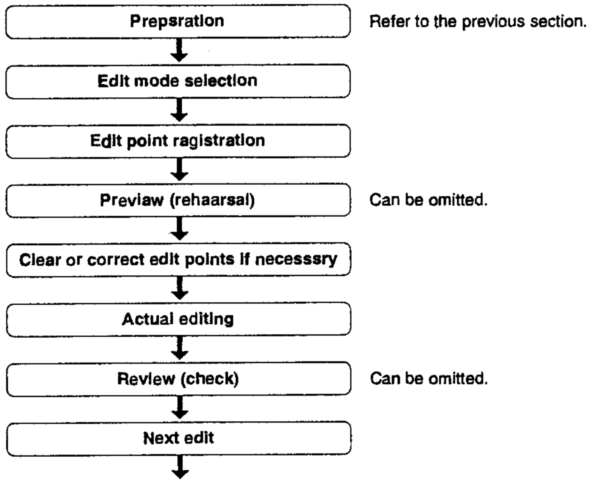
[STOP] : The STOP command is sent to a VCR.
[PAUSE/STILL] : The JOG-0 command is sent to a VCR.
[ALL STOP] : The STOP command is sent to all connected VCRs.

As a result, the actual status of the VCR sent one of these commands may vary depending on the VCR itself.

3. Basic Editing

Editing flowchart

Perform editing operations in the order shown below.


Preparation
Refer to the previous section.
Edit mode selection
Edit point registration
Preview (rehearsal)
Can be omitted.
Clear or correct edit points if necessary
Actual editing
Review (check)
Can be omitted.
Next edit

Edit mode selection

Select assemble editing or insert editing.

Assemble editing

Press the ASSEM key to engage the assemble editing mode. The indicator lights to show that the mode has been engaged. Pressing the key again cancels the assemble editing mode and the indicator goes out. Assemble editing cannot be canceled or selected during preview or actual editing.

Insert editing

VIDEO
AUD-1
AUD-2
TC

For Insert editing, press the key(s) corresponding to the signal(s) you wish to insert.

[VIDEO] : Video signal
[AUD-1] : Normal audio Left CH (CH 1)
[AUD-2] : Normal audio Right CH (CH 2)
[TC] : Time code signal

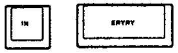
The indicator(s) for the selected key(s) light(s). Pressing the same key(s) again de-selects the signal(s) and the indicator(s) goes out. Insert keys can be selected and de-selected even during preview and actual editing.

3. Basic Editing

Registering edit points

Registering the player's edit points

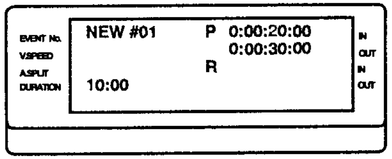
1. Locate the edit-in point.
   Locate the edit-in point with the player's keys and Jog/Search controls. Put the player in Pause at the beginning of the cut you wish to record.
2. Register the edit-in point.
   While holding down the player's IN key, press the ENTRY key.



When the edit-in point has been registered, the IN indicator above the player's time counter lights. Edit-in time data is shown on the LCD event display.

3. Locate the edit-out point.
   Locate the edit-out point with the player's keys and Jog/Search controls. Put the player in Pause at the end of the cut you wish to record.
4. Register the edit-out point.
   While holding down the player's OUT key, press the ENTRY key.

When the edit-out point has been registered, the OUT indicator above the player's time counter lights. Edit-out time data is shown on the LCD event display.

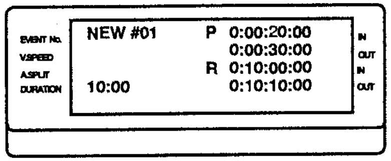

EVENT No.
V.SPEED
ASPLIT
DURATION
NEW #01
10:00
P 0:00:20:00
0:00:30:00
R
IN
OUT
IN
OUT

Example of display after player's edit-in and edit-out points have been registered

Registering the recorder's edit points

5. Locate the edit-in point.
   Locate the edit-in point with the recorder's keys and Jog/Search controls. Put the recorder in Pause at the point where you want recording to start.
6. Register the edit-in point.
   While holding down the recorder's IN key, press the ENTRY key.

When the edit-in point has been registered, the IN indicator above the recorder's time counter lights. The recorder's edit-out point does not need to be registered because it is determined automatically according to the player's duration. If the recorder's edit-out point is registered, the player's OUT indicator goes out.

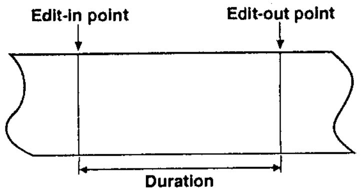

EVENT No.
V.SPEED
ASPLIT
DURATION
NEW #01
10:00
P 0:00:20:00
0:00:30:00
R 0:10:00:00
0:10:10:00
IN
OUT
IN
OUT

Example of display after registration of the edit-in and edit-out points of the player and recorder

Edit points can be registered without pausing the VCRs. Registration is possible even during play or search play.

Duration

The length of time between the edit-in point and edit-out point is referred to as the duration.


Edit-in point
Edit-out point
Duration

3. Basic Editing

Preview (rehearsal)

Preview allows you to see what an edit will look like before executing the actual edit. By "rehearsing" the edit, you can check switching at the edit-in and edit-out points and confirm that video/audio you want to record will be recorded.

1. Ensure that the edit points have been registered.
2. Press the PREVIEW key.

The player and recorder are activated and the specified edit is executed without recording. You can view the preview edit on the recorder's monitor. Preview ends automatically when the edit-out point is reached and the tape is postrolled for the specified time.In assemble editing, postroll time is fixed at 1 second.

Postroll: Refer to page 29.

To restart preview

Press the PREVIEW key during preview to restart preview from the beginning.

To pause preview before completion

Press the ALL STOP key. Both the player and recorder enter the still mode.

To preview the scene near the edit-out point

While holding down the SHIFT key, press tho PREVIEW key. Preview near the edit-out point starts. This is not possible in assemble editing.

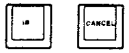
SHIFT
PREVIEW

Clearing or changing edit points

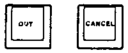
Edit points can be cleared or changed after preview if necessary.

Clear

Clearing the edit-in point
While holding down the IN key of the VCR in question, press the CANCEL key. The IN indicator above the time counter goes out and the data on the LCD event display disappears.

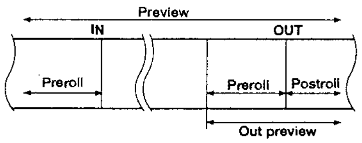


Clearing the edit-out point
While holding down the OUT key of the VCR in question, press the CANCEL key. The OUT indicator above the time counter goes out and the data on the LCD event display disappears.



Preview and out preview

- With the preview function, the section from the preroll point of the edit-in point to the postroll point can be checked.
- With the out preview function, the section from the preroll point of the edit-out point to the postroll point can be checked. This function is convenient when it is not necessary to check an entire edit.



3. Basic Editing

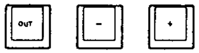
Changing edit points

A previously registered edit point can be corrected (trimmed) on a per-frame basis.

Changing the edit-in point
Ensure that the IN indicator is lit. While holding down the IN key of the VCR in question, press the – or + key. The edit-in point changes by +/– 1 frame each time you press the key.

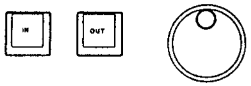
The new edit-in data appears on the IN display of the LCD event display. It is also displayed on the time counter as long as you hold down the IN key. The edit-in point can also be changed with the recorder's jog dial.

Changing the edit-out point
Ensure that the OUT indicator is lit. While holding down the OUT koy of the VCR in question, press the – or + key. The edit-out point changes by +/– 1 frame each time you press the key.



The new edit-out data appears on the OUT display of the LCD event display. It is also displayed on the time counter as long as you hold down the OUT key. The edit-out point can also be changed with tho reccrdor's jog dial.

Changing the duration (edit length)
Ensure that the IN and OUT indicators are lit. While holding down the IN and OUT keys of the VCR in question, turn the recorder's jog dial until the required duration is displayed.



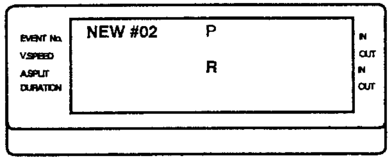
3. Basic Editing

Actual editing

Press the AUTO EDIT key to start actual editing.

The player and recorder preroll and recording starts from the edit-in point. When the edit-out point is reached, the recorder switches to the Play mode. Both units play back for 1 second past the edit-out point, then move the tape back to 1 frame before the edit-out point and enter the Still mode. The editing data on the LCD event display is registered in the EDL memory, the current displayed information disappears and the display stands by for the input of the next event.

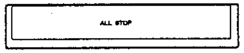
Example



Next event input standby display

To pause editing before the edit ends

Press the ALL STOP key.



The player and recorder enter the Pause mode at the position where the key is pressed. There will be some picture disturbance at this point. As editing is not ended when the Pause mode is engaged, edit review is not possible.

To end editing before the edit-out point

While holding down the OUT key, press the ENTRY key.

- The point at which the keys are pressed is re-registered as the edit-out point. Editing ends and the unit stands by for input of the next event.
- Pressing the AUTO EDIT key also ends editing and the point at which the key is pressed is re-registered as the edit-out point.

Review

After the actual edit has been executed, you can check the result with the Review function.

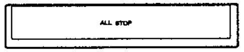
Ensure that editing has ended. Press the REVIEW key.

- The recorder plays the recorded part.
- After the edit-out point, the tape continues to play for the preset postroll time.
- The postroll time can be set via the set-up menu.
- The postroll time is fixed to 1 sec. when review is executed for assemble editing.
  (Refer to "Set-Up Menu Switch Setting" on page 33.)

Postroll: Page 29

To pause review before it ends

Press the ALL STOP key. The player and recorder pause at the point where the key is pressed.



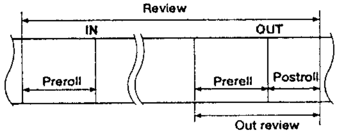
To review the picture near the edit-out point

While holding down the SHIFT key, press the REVIEW key. The portion of tape just before the edit-out point will be played back.

SHIFT
PREVIEW

Review and out review

- With the review function, the section from the preroll point of the edit-in point to the postroll point can be checked.
- With the out review function, the section from the preroll point of the edit-out point to the postroll point can be checked. This function is convenient when it is not necessary to check an entire edit.



Chapter 5
Configuring The RM-G828U

You can configure the RM-G820U's set-up to suit your preferences using the set-up menus and the rear-panel DIP switches.
This chapter gives description on the set-up procedures and contents.

1. **Set-Up Menu Switch Setting**..................................38
2. **Description Of Menus**..40
3. **Rear-Panel DIP Switches**......................................44

5. Configuring The RM-G829U

1. Set-Up Menu Switch Setting

Set-up menu switch setting

To use the set-up menus to switch settings, follow the steps below.

Display the set-up menu

Select the menu switch you wish to set

Change the setting

Enter the setting

Quit the set-up menu

The set-up menu can be set with the keys on the RM-G820U's control panel or the optional 10-key keypad. This section describes the method using the keys on the RM-G820U's control panel. For information on using the optional 10-key keypad, refer to "Set-up Menu Switch Setting" on page 75.

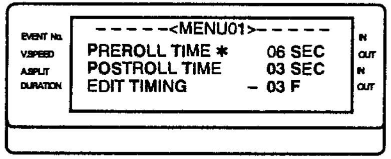
This unit can retain set-up menu and EDL data for a maximum of one week. Data backup duration depends on how long power is applied after the RM-G620U is first turned on. If power is applied for more than 2 hours, the data backup function works for 24 hours. If power is applied for more than 5 hours, the data backup function works for 1 week.
When actual data is different from the previously set data, set set-up menu <MENU 16> "DATA INITIAL" to OK. In this case, the set-up menus are reset to factory-preset settings and all data stored in the EDL event memory is deleted.

Display the set-up menu

Hold down the SHIFT key and press the MENU button.

The set-up menu appears on the LCD event display.

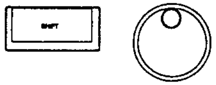
Example



- - - - -<MENU01>- - - - -
PREROLL TIME ✱ 06 SEC
POSTROLL TIME 03 SEC
EDIT TIMING - 03 F

Select the menu switch you wish to set

Hold down the SHIFT key and rotate the jog dial in the recorder's VCR control section until the desired menu appears.



Set-up menu switches are numbered from 01 to 18.

Refer to "Description Of Menus" on page 40.

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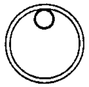
5. Configuring The RM-G828U

1. Set-Up Menu Switch Setting

Change the setting

Move the ✱ mark by rotating the recorder's jog dial.



To change the settings of menus 01, 07 and 08, you must change the numeric data. Use the + or – keys to change the data.

Menu Switch 09 is for checking purposes and cannot be changed.

Enter the setting

Press the ENTRY key.

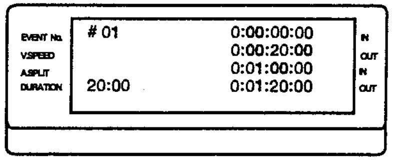
The new setting will be stored in memory.

CAUTION:
The new setting will be cleared if you don't press the ENTRY key.
Be sure to press ENTRY each time you change a setting.

Quit the set-up menu

Press the ALL STOP key.

Set-up Menu is canceled and the standard LCD event display is restored.



01 0:00:00:00
0:00:20:00
0:01:00:00
20:00 0:01:20:00

Example

2. Description Of Menus

Read this section for a detailed description of all available menus.

Menu No.	Displey	Factory preset	Description
<MENU01>	PREROLL TIME	06 SEC	The preroll time can be set in 1-second steps ranging from 1 to 59 seconds.
	POSTROLL TIME	06 SEC	The postroll for preview and review of the insert editing can be set in 1-seccnd steps ranging from 0 to 59 seconds. Note that the postroll time for aotual editing and assemble editing is fixed at 1 second and cannot be changed.
	EDIT TIMING	-03F	This setting determines when the recording start command is sent to the VCR with respect to the edit-in points. When the recorder's edit points have been shifted, adjust this setting. Timing can be in 1-frame steps ranging from 0 to –29 frames. This value is set automatically when the BR-S822U or BR-S800U is ccnnected.
<MENU02>	SYNC GRADE	0F	Sets synchronization accuracy in editing. This setting is valid only when the BUMP switch is ON (i.e. phase modification is activated). 0 F : Use this setting when accurate synchronization is required. Note that 0-frame accuracy may not be achieved if the external sync signal is not input to connected equipment. +/–1 F : Use this setting when too many retries are required with the 0 F setting. ROUGH : Use this setting if no retry is required even when synchronization accuracy is decreased by external factors (wow & flutter, tape stretch, etc.).
<MENU03>	BUZZER	ON	This setting determines whether or not the buzzer sounds when a control key or button is pressed. ON : Buzzer beeps. OFF : Buzzer does not beep except when an error message is displayed.
<MENU04>	EVENT MEMORY	ON	This setting determines whether or not generated event data can be registered in memory. ON : Event data registration is enabled. Use this setting fcr multi-event editing. Up to seven events can be registered using the motion memcry. OFF : Event data registration or recall is disabled. With this setting, editing with the mction memcry can be executed as many times as required.

2. Description Of Menus

Menu No.	Display	Factory preset	Description
<MENU05>	MATCH FRAME	OFF	This setting determines whether or not the match frame function is used. Refer tc "Time tracking/ Match- frame function" on page 65. OFF : Match- frame is disabled. ON : Match- frame is enabled. After an edit has been executed, the edit-out points of bcth the player and reccrder are automatically registered as the edit-in points fcr the next edit. The time tracking function is also activated when this setting is on. ON (+VTR) : Both the time tracking and match-frame functions are activated. Also, if the recorder's edit point is corrected with the time tracking function, the VCR automatically searches the new edit point. So ycu can confirm the new edit point on the monitor.
<MENU06>	PLAYER ADVANCE	0F	During editing, this function switches the player's edit-in point correction function ON and OFF. This is necessary when a video switcher incorpcrating frame memory is used. 0 F : No correction is applied. Normally use this setting. +1F : Ccrrection is applied. Use this setting when using a video switcher incorporating frame memory.
<MENU07>	GPI SET	0F	These switches set the GPI signal automatic output timing for GPI output jacks 1 to 3. Automatic output cannot be set to OFF. Use <MENU08> "GPI-4 SET" to set GPI-4. GPI 1 to 3 RIN : Each of these switches sets the signal output timing for the corresponding GPI output. Timing is set relative to the recorder's edit-in point. Different settings for each event can be executed and registered in the EDL event memory. Setting range: –59 sec. 29 frames to +59 sec. 29 frames Note: RIN stands for "Recorder In Foint".
<MENU08>	OPI-4 SET	0F	RIN+ :This switch sets the signal output timing for GPI-4. : Setting range: –30 frames to +30 frames MAN TAKE :Set to this position when manual take is executed using the MAN.TAKE button. Automatic output is set to OFF.
<MENU09>	DIP SW	F (OFF)	Displays the current settings cf SW1 cn the rear panel and SW2 inside the RM-G820U. These settings cannot be changed with this menu. "F" indicates that the switch is OFF and "O" that it is ON. The factory setting for all switches is "F" (OFF).

2. Description Of Menus

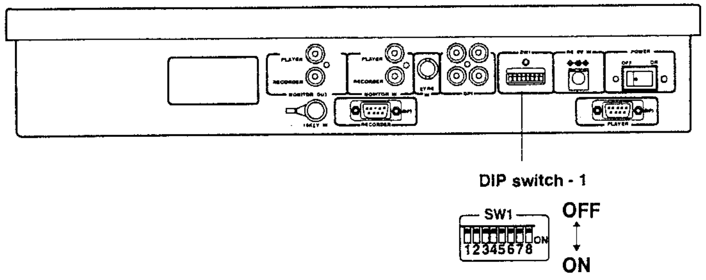
Menu No.	Display	Factory preset	Description
<MENU10>	MENU DISPLAY	ENGLISH	Selects the menu or error message display language from English or Japanese. ENGLISH : English language display. JAPANESE: Japanese language display.
<MENU11>	OVERFLOWED EDIT	INHIBIT	Determines whether or not registration of the 99th event is inhibited or if overwriting is executed when set-up menu <MENU 04> "EVENT MEMORY" is set to ON. INHIBIT : The 99th event cannot be registered. If you try to register the 99th event, an error message appears indicating that additional events cannot be registered. Press the ALL STOP to delete error message so that editing can continue. In this case, the 99th event data is changed. OVERWR : The 99th event can be registered by overwriting. In this case, each time new event is registered, previously registered events are deleted in order, starting from the lowest number. Therefore, the events registered in the EDL memory are the latest 98 events.
<MENU12>	EDL ALL CLEAR	NO	Use this switch to clear all registered event data. NO : Not cleared. OK : Pressing the ENTER key clears all of the registered event data. After this, the setting is automatically set to NO.
<MENU13>	ASSEMBLE LOCK	OFF	This switch can be set to prevent accidental activation of assemble editing. OFF : Pressing the ASSEM key engages the assemble editing mode. ON : The assemble editing mode cannot be engaged unless the SHIFT key is held down when the ASSEM key is pressed. This makes accidental operation impossible.
<MENU14>	PROGRAM PLAY MODE	OFF	When a Variable Tracking VCR is connected, this switch lets you set the player's playback speed in 0.1% increments. The setting range is from 80% to 120% of the normal playback speed. OFF : VMC playback is possible but playback speed cannot be set in 0.1% steps. ON : The program play mode is activated and the player's playback speed can be set in 0.1% steps using the optional 10-key keypad. The setting range is from 80% to 120% of the normal playback speed. (Refer to "Program Play Mode" on page 74.)

2. Description Of Menus

Menu No.	Display	Factory preset	Description
<MENU15>	ANIMATION MODE		This switch turns the animation mode on and off when using only the recorder (AUX editing). (Refer to "Animation Mode" on page 63.) OFF : The animation mode is disabled. ON : The animation mode is enabled. Each time an edit has been executed, the edit-out point is set as the edit-in point for the next edit. The edit-out point for the next edit is set automatically to match the duration of the previous edit. Consequently, animation editing can be executed simply by pressing the AUTO EDIT key.
<MENU16>	DATA INITIAL (ALL DATA CLR)	NO	Data initialization resets all menu items to the original factory settings and clears all event data. NO : Data will not be reset. OK : Pressing the ENTRY key resets all menu items to the original factory settings and clears all event data. After this, the setting is automatically set to NO.
<MENU17>	CTL MODE	9H	Sets the time counter for CTL signals to 9-hour display or 24-hour display. 9H : Time display up to +/–9 hr. 59 min. 59 sec. 29 frames. 24H : Time display up to 23 hr. 59 min. 59 sec. 29 frames.
<MENU18>	BUMP SELECT	RECORDER	When BUMP is applied, this setting specifies whether the player or recorder is controlled. RECORDER : The recorder is controlled. Use this setting, when editing with an EP-recorded tape in the player. PLAYER : The player is controlled.

3. Rear-Panel DIP Switches

A variety of functions can also be set using the DIP switches on the RM-G820U's rear panel.
When changing DIP switch settings, turn the power of the RM-G820U off and then on again.



The factory setting for all switches is OFF.

The functions of each set of switches are described below.

SW1-1 Time code preset/GPI msnual take
This switch activates or deactivates the time code preset mode and the manual take function for GPI-1 to 3.

OFF : These functions are deactivated.
ON : Manual take for GPI-1 to 3 is enabled. Manual take is always enabled for GPI-4 regardless of the setting of this switch.
Manual output of GPI signals:
GPI-1 : Press the VIDEO key while holding down the SHIFT key.
GPI-2 : Press the AUD-1 key while holding down the SHIFT key.
GPI-3 : Press the AUD-2 key while holding down the SHIFT key.
The time code and user bits can be preset using an optional 10-key keypad.
(Refer to "Preset time Code /user bit" on page 72.)

SW1-2 RTC mode
This switch determines how the recorder's lap time is calculated during time code editing.

OFF : The time from the last registered edit-in point is displayed as the lap time.
ON : The total time since the lap time was last reset is displayed as the lap time.

SW1-3 Service switch
This switch is used in servicing and should always be kept in the OFF position.

SW1-4 Open edit all stop out entry
This switch determines what mode will be used to end editing when the ALL STOP key is pressed during epen-edit editing, that is, when the edit-out point for the player and recorder have not been registered beforehand.

OFF : Editing is interrupted and the VCRs enter the still mode. The point at which the ALL STOP key is pressed is not registered as the edit-out point. In this case, there may be some signal disturbance at the edit-out point.
ON : Editing ends and the time data for the point where the ALL STOP key is pressed is registered as the edit-out point.

3. Rear-Panel DIP Switches

SW1-5 Review switch
This switch selects the edit review mode used in conjunction with the motion memory. This setting only affects editing operations which use the motion memory.

OFF: After actual editing has been executed, the recorded edit is played back.
ON: In either case, before or after execution of actual editing, the player plays back the tape at the speed stored in the motion memory. (Motion memory preview operation)

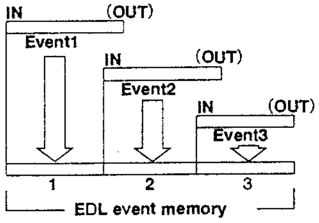
SW1-7 Auto cleanup/direct trim
This switch turns the auto cleanup and direct trim function ON and OFF. This function simplifies edit point registration and modification.

OFF : The Auto cleanup and direct trim function are deactivated.
ON : Auto cleanup function is activated. (Refer to "Auto cleanup function" .)
Thanks to the direct trim function, you can change edit points simply by entering the number of frames to change and pressing the ENTER key twice. There is no need to input edit data to be corrected in the scratch pad area using the 10-key keypad. (Refer to "Direct trim function" on page 75)

SW1-8 News edit switch
Switches the news edit function ON and OFF. (Refer to "News edit " on page 66)

OFF : News Editing is deactivated.
ON : News editing is activated. In this case, edit data is not registered in the EDL event memory.

Auto cleanup function
This function is activated when the recorder's edit-in point for a new event is registered.
If the new event edit-in point and the edit-out point of the previous event overlap, the edit-out point of the previous event is automatically changed to match the edit-in point of the new event and registered in the EDL event memory. This function allows approximate edit-out point setting, speeding up and enhancing efficiency in offline editing.



The edit-out point of each event is changed to the edit-in point of the next event.

Chapter 6
EDL Management

You can enter and store up to 98 sets of event data in the RM-G820U's built-in EDL memory. Edit event data (all edit-related data including mode, edit points, special-effects timing, playback speed, etc.,) is generated when an edit is executed or when data is input via the 10-key pad or Jog dials. Depending on the length of the program, you may be able to enter all necessary event data prior to actual editing. This chapter covers event data registration procedures and general EDL management.

1. **Entering Evont Data** 48
2. **Registering Event Data** 49
3. **Prooessing Event Data (Danomhoring /Rippla)** 50
4. **What To Ro It Ragistration Fails** 51

6. EDL Management

1. Entering Event Data

Types of event data

A set of event data can include any or all of the following data.

1. **Editing mode**
2. **Event number**
3. **V.SPEED (Variable speed) data**
4. **Audio-split timing**
6. **Player's edit points**
6. **Recorder's edit points**
7. **Duration**
6. **GPI timing**

Data for numbers 2 through 7 are displayed on the LCD event display when entered.
The editing mode is set using the edit mode select keys. GPI timing is set using the set-up menus.

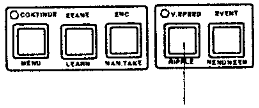
How to entor data

1. **Editing mode**
   Press the edit mode seleot keys. (Refer to "Editing mode selection" on page 32.)

ASSEM
VIDEO
AUD-1
AUD-2
TC

2. **Event number**
   When an event is registered, this number is automatically input.
   This number is determined automatically and must be specified when recalling event data. (Refer to "Recalling event data" on page 49.)

3. **V.SPEED**
   Press the + or – key while holding down the V.SPEED button. If you like, you can use the recorder's jog dial in place of the + or – key. (Refer to "Variable-Speed Motion Control" on page 57.)



V.SPEED button

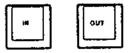
4. **Audio-split timing**
   Press the + or - key while hclding down the SPLIT key or use the reccrder's jog dial. You can also search the tape position where normal audio is to be recorded by operating the recorder. After location cf the edit-in point, press the ENTRY key while holding down the SHIFT and IN keys or press the ENTRY key while holding down the SPLIT key. (Refer to "Audio-Split Editing" on page 60.)

6. **Player's edit points**
   Press the ENTRY key while holding down the player's IN or OUT key. (Refer to "Registering edit points" on page 33.)

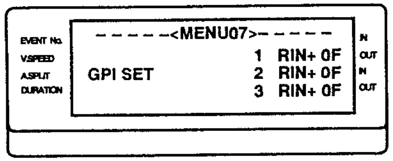
6. **Recorder's edit points**
   Press the ENTRY key while holding down the recorder's IN or OUT key. (Refer to "Registering edit points" on page 33.)

IN
OUT
ENTRY
IN
OUT

7. **Duration**
   This data is usually entered automatically when the edit points are registered.
   You can change the duration by turning the recorder's jog dial while holding down the IN end OUT keys simultaneously.
   (Refer to "Changing cr correcting edit points" on page 84.)



8. **GPI timing**
   Set GPI timing using either <MENU07> "GPI SET" or <MENU08> "GPI-4 SET". The setting is copied when the next event is registered. (Refer to "Configuring The RM-G820U" on page 87.)
   However, when an event is deleted, GPI timing is reset.



```
EVENT No.   - - - - -<MENU07>- - - - -        IN
VSPEED                          1  RIN+ 0F    OUT
ASPLIT      GPI SET             2  RIN+ 0F    IN
DURATION                        3  RIN+ 0F    OUT
```

2. Registering Event Data

Registering data in the EDL svsnt memory

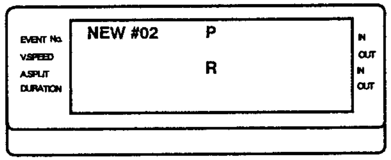
All entered data is registered as a single event.

There are two ways of registering event data.
Press the AUTO EDIT key:
Editing is executed and the event data is registered on completion of the edit.
After registration, the unit stands by for entry cf the next event.

Press the AUTO EDIT key while holding down the SHIFT key.
The event data is registered immediately.
Editing is not executed.
After registration, the unit stands by for entry of the next event.

SHIFT
AUTO EDIT

Display when standing by for entry of tbe next event data

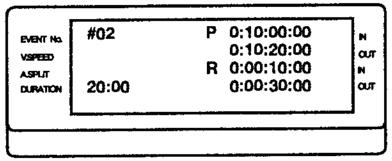


```
EVENT No.   NEW #02     P       IN
VSPEED                          OUT
ASPLIT                  R       IN
DURATION                        OUT
```

Example

With either method, next-event data will be displayed if already registered.

Display when next-event data bas already been registered



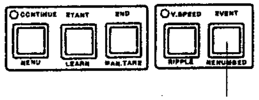
```
EVENT No.   #02         P  0:10:00:00   IN
VSPEED                     0:10:20:00   OUT
ASPLIT                  R  0:00:10:00   IN
DURATION    20:00          0:00:30:00   OUT
```

Example

Rscalling event data

Previcusly registered event data can be recalled and used to execute an edit.

Recalling event data
Press the + or – key while holding down the EVENT button.
If you like, you can use the recorder's jog dial in place of the + or - key for recalling.
The event numbers change in forward or reverse order and the events are switched accordingly.

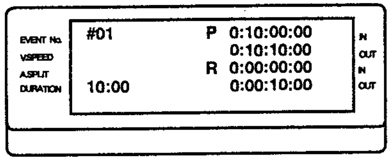


EVENT button

Recalling the last edit
For added convenienoe, an exclusive button is provided for immediate recall of the last edit event data.

Press the LAST ED key.

The last edit event data is recalled. This is convenient when you want to redo an edit that's just been exeouted.



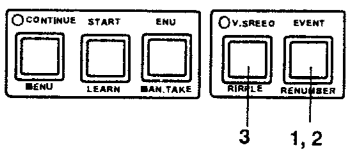
```
EVENT No.   #01         P  0:10:00:00   IN
VSPEED                     0:10:10:00   OUT
ASPLIT                  R  0:00:00:00   IN
DURATION    10:00          0:00:10:00   OUT
```

Example

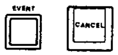
3. Processing Event Data

You can delete and renumber event data registered in the EDL memory, as well as adjust the recorder's time data so that all edits are contiguous.

Buttons used



1. **Deleting event data**
   1. Select the event you wish to delete using the Recall function. (Refer to "Recalling event data" on page 49.)
   2. With the event displayed in the LCD window, press the CANCEL key while holding down the EVENT button.



The displayed event is deleted.

Ensure that both the editing mode and GPI timing are reset.

When event data is deleted and no new event is registered, the location where the data was stored remains vacant. To optimize memory, execute the renumbering function.

2. **Renumbering:**

Consecutively renumbers events when the numbers are discontinuous.

This eliminates unregistered spaces in the EDL memory.

1. Select the event where you want renumbering to start. (Refer to "Recalling event data" on page 49.)
2. With the event displayed in the LCD window, press the RENUMBER button while holding down the SHIFT key.

SHIFT
RENUMBER

Renumbering is applied to the displayed event and all events following it.

After execution, the events are renumbered consecutively.

3. **Ripple:**

Makes the recorder's time data contiguous.

1. Select the event where you want rippling to start. (Refer to "Recalling event data" on page 49.)
2. With the event displayed in the LCD window, press the RIPPLE button while holding down the SHIFT key.

SHIFT
RIPPLE

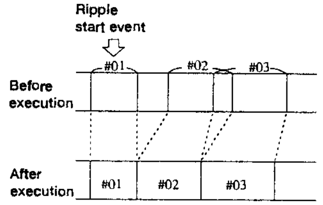
Ripple processing is applied to the displayed event and all following events and it ends with the last event displayed.

After execution, the recordar's edit-out point for each event is connected to the next event's edit-in point.

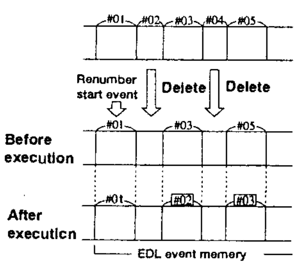
Note:

- Ripple processing cannot be applied to an event using motion memory.
- The edit-in point of the event starting ripple is linked with the edit-out point of the previous event.

Ripple operation



Renumbering operation



4. What To Do If Registration Fails

If you are unable to register event data, one of the following error messages will be displayed, depending on the cause of the problem. Check the event data by referring to the error messages.

In this section, the main error messages relating to registration are explained.

Contents of error messagee and corrective measures

■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ <ERR. 00> ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

DIFINE EDIT MODE!

Corrective Action:

Select the edit mode. (Refer to "Edit mode selection" on page 32.)

■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ <ERR. 08> ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

DURATION = 0F!

Corrective Action:

Set the duration to 1 frame or more when re-registering or correcting edit points. (Refer to "Registering edit points" on page 33 and "Changing or correcting edit points" on page 34.)

■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ <ERR. 11> ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

VT SPEED OVER 300%!

Corrective Action:

Set the V.SPEED to less than 300% when re-registering or ccrrecting edit points. (Refer to "Set the playback speed" on page 57.)

■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ <ERR.12> ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

VT SPEED OVER -200%.

Corrective Action:

Set the V.SPEED to more than -200% when re-registering or correcting edit points. (Refer to "Set the playback speed" on page 57.)

■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ <ERR.13> ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

DIFINE AUDIO MODE!

Corrective Action:

Select the audio insert key (AUD-1, AUD-2).

■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ <ERR. 17> ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

IN/OUT REVERSED!

Corrective Action:

Set the duration to more than 1 frame when re-registering or correcting edit points. (Refer to "Registering edit points" on page 33 and "Changing or correcting edit points" on page 34.)

For editing using the variable motion control function, match the code of the V.SPEED with the code of the duration.

■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ <ERR. 18> ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

IN/OUT NOT ENOUGH!

Corrective Action:

Register edit point which has not been registered. (Refer to "Registering edit points" on page 33.)

■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ <ERR.20> ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

EVENT FULL!

<MENU11>OVERWR:INH.

Corrective Action:

If you need to overwrite event data registered in the EDL event memory, set set-up menu 11 "OVERFLOWED EDIT" to "OVERWR".

■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ <ERR. 21> ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

EVENT MEMORY INH.

<MENU04> EVENT :INH.

Corrective Action:

Set <Menu04> "EVENT MEMORY" to ON. (Refer to "Set-Up Menu Switch Setting" on page 39.)

Chapter 7

Advanced Editing Operations

This chapter introduces you to the advanced editing operations you can perform with the RM-O620U. For some operations, you will need to connect additional external equipment such as a special-effects generator or audio mixer. If you have any questions about setting up or using connected equipment, please read the operating instructions for that particular machine. For instructions on registering edit points and selecting editing modes, refer to "Basic Editing Operations".

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Before attempting to carry out any advanced editing operations, please ensure that the following settings are set correctly.
The settings below are for the BR-S800U and are examples only.
The settings may differ depending on the editing recorder you are using.
Check the recorder's instruction manual for details.

1. **Put the RM-G820U into the REMOTE mode so that it can control the VCRs.**
   Set the REMOTE/LOCAL switch to REMOTE.
2. **Match the editing timings.**
   VIDEO EDIT DELAY 8 FRAMES
   AUDIO EDIT DELAY 8 FRAMES
3. **Match the 9-pin serial command format.**
   9PIN DEVICE TYPE ID JVC SVHS-1

Other settings are required in some operations. These will be described in the relevant sections below.

7. Advancod Editing Oporations

1. Operating Special-Effects Equipment

You can remote-control the faders on special-effects units directly from the RM-G320U. To do this, you must connect the special-effects equipment to the RM-G820U's GPI output jacks. (Refer to "Building An Editing System" on page 7.) There are two ways of oontrolling special-effects faders:

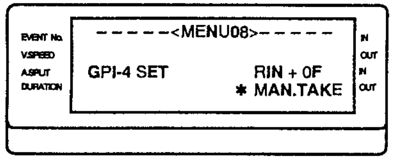
1. Automatic fader control during editing with preset timings
2. Manual fader control during editing (Menual take)

Automatic fader control during editing

1. Set the control timings on the RM-G820U.
   Use <MENU07> "GPI SET" or <MENU08> "GPI-4 SET". (Refer to "Configuring The RM-G820U" on page 37.)
2. Set the effect type on the special-effects unit.
   You cannot set the effect type (wipe, mix, etc.) on the RM-G820U.
3. Execute preview or actual editing.
   The fader control(s) is activated. The timing of fader operation is for the duration set with the set-up menu.
   During editing, GPI signals are output from GPI 1-3 at the timing set during edit registration.

Manual take (GPI-4 only)

1. Select the manual take mode.
   Set <MENU08> "GPI-4 SET" to MAN.TAKE.



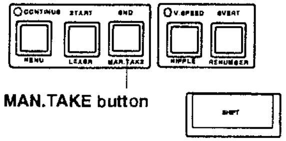
```
------<MENU08>------

GPI-4 SET            RIN + 0F
                   * MAN.TAKE
```

The manual take mode is engaged and the automatic fader control is disabled.
Even with RIN set to +0F, manual take is possible. However, the automatic fader control also operates.

2. Set the effect type on the special-effects unit.
3. Execute preview or actual editing.

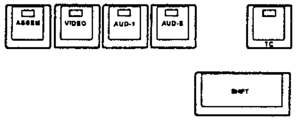
4. Remote-control the fader control manually.
   Press the MAN.TAKE button while holding down the SHIFT key.



Manual take using the MAN.TAKE button works only with equipment connected to the GPI-4 jack.

Manual take (GPI-1 to 3)

1. Set rear panel DIP SW1-1 to ON. With this setting, the manual take is possible. However, the automatic fader contrel functions at the same time. (Refer to "Configuring The RM-G820U" on page 37.)
2. Execute manual take operation.
   While holding down the SHIFT key, press the key corresponding to the GPI jack used in the manual take.
   GPI-1: Press the VIDEO key while holding down the SHIFT key.
   GPI-2: Press the AUD-1 key while holding down the SHIFT key.
   GPI-3: Press the AUD-2 key while holding down the SHIFT key.



When executing manual take only, set <MENU07> "GPI SET" to a longer time in the "-" direction than the setting made using <MENU01> "PREROLL TIME" or the preroll time setting switch. For example, if the preroll time is set to 5 sec., set the "GPI SET" to around -6 sec.

7. Advanced Editing Operatiens

2. A-roll Editing

If your system incorporates a video switcher with frame memory, you can apply a technique known as "A-roll editing" to edit transitions. A-roll editing allows you to switch from the freeze picture on the switcher to the player's playback picture.

Follow the steps below to perform A-roll editing.
1.Select the editing mode
2.Register the edit points
3.Set the GPI pulse output timing.
4.Set the timing to acquire a freeze picture with a video switcher.
5.Execute preview and actual editing

Select the editing mode

Select the editing mode by pressing the ASSEM key or the VIDEO, AUD-1, AUD-2 and TC keys as required. (Refer to "Edit mode selection" on page 32.)

ASSEM
VIDEO
AUD-1
AUD-2
TC

Register the edit points

Register the edit points for the player and recorder. (Refer to "Registering edit points" on page 33.)

Set the GPI pulse output timing

Set the timing to control a fader with <MENU08> "GPI-4 SET". (Refer to "Configuring The RM-G620U" on page 37.)

Set the timing to acquire a freeze picture with a video switcher.

Set the timing to acquire the recorder's picture by freezing it using a video switcher. Por details, refer to the video switcher's instruction manual.

Execute preview and actual editing

Press the PREVIEW key to preview the edit.
Press AUTO EDIT to execute the edit.

PREVIEW
AUTO EDIT

3. Multi-Event Editing

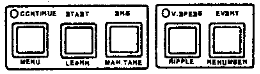
Instead of editing one scene at a time, you can automatically edit a sequence of scenes or an entire program by recalling all or part of the event data registered in the EDL memory.

To perform multi-event editing, follow the steps below.
Register multiple event data in the EDL memory
Activate the multi-event editing mode
Specify the event range to be edited
Execute editing
Return to the previous editing mode

Register event data in the EDL memory

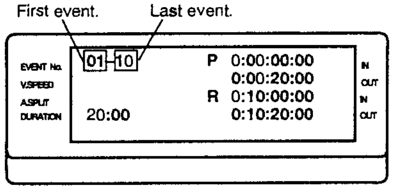
Input and register edit event data for as many edits as you want to perform (up to 98).
(Refer to "EDL Management" on page 47.)

Activate the multi-event editing mode


CONTINUE
START
ENC
V.SPEED
EVENT
MENU
LEARN
MAN.TAKE
RIPPLE
RENUMBER

Press the CONTINUE button. The indicator lights and the editing execution range is shown in the LCD's EVENT No. display.

- When the CONTINUE button is pressed, the displayed event is considered as the edit-out event. However, if the CONTINUE button is pressed with NEW event, next to last event is considered the last event.
- To cancel the multi-event editing mode, press the CONTINUE button again.


First event.
Last event.
EVENT No.
V.SPEED
ASPLIT
DURATION
01
10
20:00
P 0:00:00:00
0:00:20:00
R 0:10:00:00
0:10:20:00
IN
OUT
IN
OUT

Exsample

Specify the event range to be edited

1. Specify the first event.
   While holding down the START button, press the + or – key or rotate the recorder's jog dial.
2. Specify the last event.
   While holding down the END button, press the + or – key or rotate the recorder's jog dial.

Execute editing

Press the AUTO EDIT key. Editing is executed in the order of the events in the specified event range. As editing progresses, the event number display changes to show which event number being executed.

To pause editing before completion

Press the ALL STOP key. Editing pauses at the point where the ALL STOP key is pressed.

In this case, the initial event data is displayed on the LCD event display.

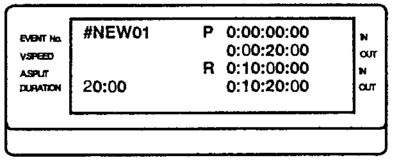
To resume editing

Press the AUTO EDIT key again. Editing restarts from the beginning of the event where editing was paused.

When all events have been edited, the indicator goes out and the normal event number is shown on the LCD's event number display section.

Return to previous editing mode

Press the CONTINUE button. The indicator goes off and the LCD's EVENT No. display shows the current event number again.


EVENT No.
V.SPEED
ASPLIT
DURATION
#NEW01
20:00
P 0:00:00:00
0:00:20:00
R 0:10:00:00
0:10:20:00
IN
OUT
IN
OUT

Exsample

The last edit can be specified with numeric input on the 10-key keypad. (Refer to "Numeric Input" on page 70.)
When an event number higher than the event number registered in the EDL memory as the last event is entered with the 10-key keypad, the last registered event will be specified as the last event.

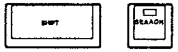
4. Variable-Speed Motion Control

By using a VCR with VT (Variable Tracking) capability as the player, you'll be able to execute noise-free playback at speeds –2x to +3x. This function can be used . . .

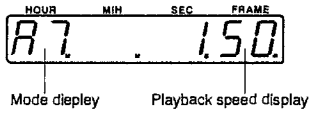
1. **To control a VCR manually (variable mode).**
2. **For auto editing.**
3. **To control the playback speed (motion memory).**

Activating the variable-speed mode.

Press the SEARCH key while holding down the SHIFT key.


SHIFT
SEARCH

The variable mode display appears on the time counter.


HOUR
MIN
SEC
FRAME
A 1. 1.50.
Mode display
Playback speed display

Rotate the search ring. The playback speed is shown on the time counter's playback speed display. The speed is displayed in percentages relative to the normal speed. (e.g. 1.5x = 150%)

To quit the variable-speed mode

Press the STOP key. The normal time counter display is restored.

STOP
STB OFF

Using variable-speed motion control in automatic editing

To use the variable-speed motion control function in automatic editing, follow the steps below.

Select the editing mode
Register the edit points
Set the playback speed
Manually controlling the playback speed
Review
Actual editing

Select the editing mode

Select the editing mode by pressing the ASSEM key or the VIDEO, AUD-1, AUD-2 and TC keys as required. (Refer to "Edit mode selection" on page 32.)

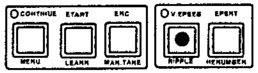
ASSEM
VIDEO
AUD-1
AUD-2
TC

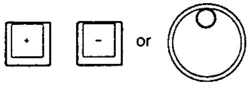
Set the playback speed

While holding down the SHIFT key, press the player's SEARCH key.
The variable mode is displayed in the time counter.
Set the speed to be used for editing by rotating the player's search dial.
Press the V.SPEED button.

Change the playback speed

To change the set playback speed, press the + or - key or rotate the recorder's jog dial while holding down the V.SPEED button.


CONTINUE
START
ENC
V.SPEED
EVENT
MENU
LEARN
MAN.TAKE
RIPPLE
RENUMBER



When all 4 edit points, that is, the player's and recorder's edit-in and edit-out points are registered, the playback speed cannot be changed. Cancel one of these 4 edit points or correct them.

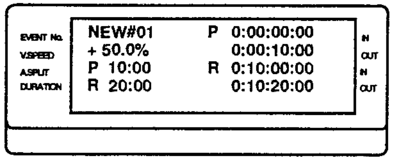
4. Variable-Speed Motion Control

Register the edit points

Register three edit points for the player and recorder. When all edit points (the player's and recorder's edit-in and edit-out points) are registered, the set playback speed is automatically calculated and adjusted.
(Refer to "Registering edit points" on page 33.)

The effeot of variable-speed playback on edit point registration
When you're editing using the variable-speed motion control, the duration of the player is different from that of the recorder.

Example



If the player's playback speed is half the recorder's speed, the player's duration will be half the recorder's duration.

Execute preview and actual editing

Press the PREVIEW key to preview the edit.
Press AUTO EDIT to execute the edit.

Manually controlling the playback speed

The speed at which the player was played back during preview can be stored in memory. This stored speed data can be used for playback in actual editing.

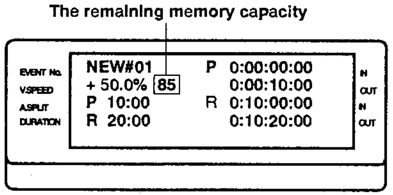
1 Follow the same procedure as above in "Using variable-speed motion control in automatic editing". Set the editing mode, playback speed and edit points (edit-in point only for the player). If the player's edit-out point has been already registered, this operation cannot be performed.

2 Press the PREVIEW key.

3 Control the playback speed with the player's search ring.
The speed data determined by the position of the search ring is stored in the motion memory. Speed data for up to 127 different positions can be stored. When the remaining memory capacity drops to 99 or below, it is shown on the LCD event display.

After performing the setting, "MM" is displayed, showing that the event uses motion memory.

***Data stored in memory is erased when the edit points or V.SPEED data are changed.**



Example

To re-start playback speed control

If you need to change the initial playback speed, refer to "Change the playback speed" on page 57.

1 Press the PREVIEW key again.

---

2 Control the playback speed with the player's search ring.
You can store and replace speed data as often as necessary by repeating this procedure.When the search dial is rotated, previous speed data stored in the motion memory is cleared and new data is registered. If the search dial is not rotated, the previous data remains as is.

Checking the contents of tha motion memory

Before you start the actual editing operation, you can see the results of your manual speed setting by using the review function.

Press the REVIEW key.

The player's playback is controlled with the speed data stored in the motion memory. In this case, the indicators of the PREVIEW and REVIEW keys light up, showing review of the motion memory.

After actual editing, the player is not controlled with the speed data stored in the motion memory when the REVIEW key is pressed. To check the player's control, set the rear-panel DIP switches 1-5 to ON.

Actual editing

Press the AUTO EDIT key.

Editing starts end the player's playback speed is controlled according to the speed data stored in the motion memory during preview.

> You can register up to seven edit events using the motion memory in the EDL event memory.

Checking the editing results

After editing has been completed, the edit can be checked with the REVIEW key.

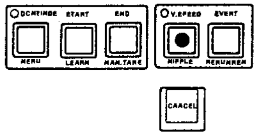
1. Press the REVIEW key.

The recorder rewinds to the beginning of the edit and enters the play mode. You can view the results on a monitor.

> You cannot use the REVIEW key to check the results of manual playback speed setting as stored in the motion memory.

Return to normal editing

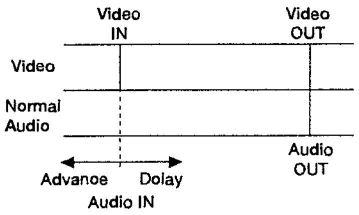
Press the CANCEL key while holding down the V. SPEED button.



The indicator goes off and the speed data disappears from the LCD's V. SPEED.

5. Audio-Split Editing

The normal audio edit-in points (audio IN) can be shifted with respect to the video edit-in points. Audio-split editing is not available if V. SPEED has been set.


Video IN
Video OUT
Video
Normal Audio
Audio OUT
Advance
Delay
Audio IN

Follow the steps below to perform audio-split editing.
Select the editing mode
Register the edit points
Set the normal audio edit-in point
Execute preview and actual editing
Cancel the audio-split editing mode

Select the editing mode

Select the editing mode by pressing the appropriate insert editing key(s).
(Refer to "Editing mode selection" on page 32.)

ASSEM
VIDEO
AUD-1
AUD-2
TC

Audio-split editing is not possible in the assemble editing mode,the News edit mode and the AUX mode.

Register the edit points

Register the edit points for the player and recorder.
(Refer to "Registering edit points" on page 33.)

Set the normal audio edit-in point

This procedure involves setting the deviation of the normal audio edit-in point with respect to the recorder's edit-in point.

Setting range
The maximum setting range is between +/-11 hours 59 minutes 59 seconds 29 frames. However, only the range between +/-59 seconds 29 frames can be stored as event data and recalled using the EDL memory or the last edit function.

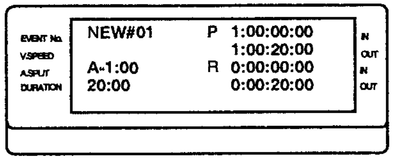
Any of the following setting methods can be used.

1. Press the + or – key while holding down the SPLIT key.
2. Rotate the recorder's jog dial while holding down the SPLIT key.
3. Cue the position by operating the player or recorder, and set it for the normal audio edit-in point.
   While holding down the SHIFT key and the cued VCR's **IN** key, press the **ENTRY** key.
   When the recorder is cued, setting can also be performed by pressing the ENTRY key while holding down the SPLIT key.

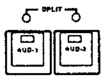
SHIFT
IN
ENTRY

When the normal audio edit-in point is set, the entered data appears on the LCD's A.SPLIT display.

Example


EVENT No.
V.SPEED
A.SPLIT
DURATION
NEW#01
A-1:00
20:00
P 1:00:00:00
1:00:20:00
R 0:00:00:00
0:00:20:00
IN
OUT
IN
OUT

When the AUD-1 or AUD-2 key is pressed, the SPLIT indicator above it lights.


SPLIT
AUD-1
AUD-2

5. Audio-Split Editing

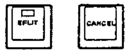
Execute preview and actual editing

Press the PREVIEW key to preview the edit.
Press AUTO EDIT to execute the edit.

PREVIEW
AUTO EDIT

Cancel audio-split editing

Press the CANCEL and SPLIT keys simultaneously.

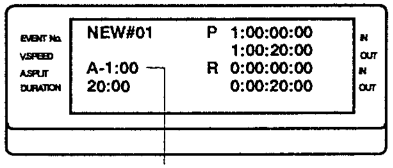

SPLIT
CANCEL

The SPLIT indicator goes off and the data disappears from the LCD's A.SPLIT display.

Time data display on the A.SPLIT display

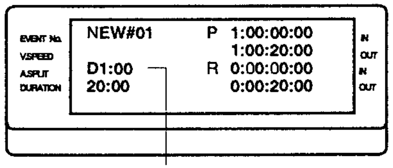
The time data display varies according to the position of the normal audio edit-in point with respect to the recorder's edit-in point.

Example: Advanced normal audio edit-in point


EVENT No.
V.SPEED
A.SPLIT
DURATION
NEW#01
A-1:00
20:00
P 1:00:00:00
1:00:20:00
R 0:00:00:00
0:00:20:00
IN
OUT
IN
OUT

Advanced

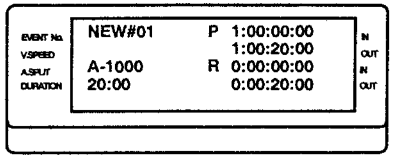
Example: Delayed normal audio edit-in point


EVENT No.
V.SPEED
A.SPLIT
DURATION
NEW#01
D1:00
20:00
P 1:00:00:00
1:00:20:00
R 0:00:00:00
0:00:20:00
IN
OUT
IN
OUT

Delayed

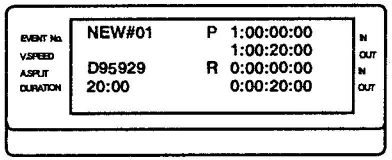
Time data display restrictions

- If the A. SPLIT time data on the LCD display is 10 seconds or more, the colon separating the numbers (:) is not displayed.

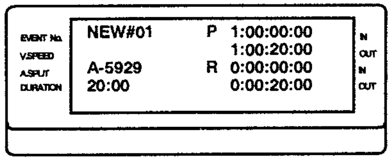

EVENT No.
V.SPEED
A.SPLIT
DURATION
NEW#01
A-1000
20:00
P 1:00:00:00
1:00:20:00
R 0:00:00:00
0:00:20:00
IN
OUT
IN
OUT

Example: When a 10-second advance is set

- Allowable time display in the A.SPLIT display section is from Advance 59 seconds 29 frames to Delay 9 minutes 59 seconds 29 frames.


EVENT No.
V.SPEED
A.SPLIT
DURATION
NEW#01
D95929
20:00
P 1:00:00:00
1:00:20:00
R 0:00:00:00
0:00:20:00
IN
OUT
IN
OUT

Example: When a 9 minute 59 seconds 29 frames delay is set

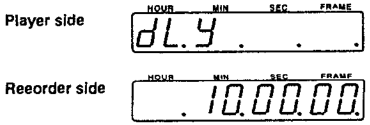

EVENT No.
V.SPEED
A.SPLIT
DURATION
NEW#01
A-5929
20:00
P 1:00:00:00
1:00:20:00
R 0:00:00:00
0:00:20:00
IN
OUT
IN
OUT

Example: When a 59 seconds 29 frames advance is set

Checking the setting

Press the SPLIT key to check the audio-split setting with all figures.
Data with all figures is displayed on the time counters.

Example: When a 10-minute delay is set.


Player side
HOUR
MIN
SEC
FRAME
dL.Y . . .
Recorder side
HOUR
MIN
SEC
FRAME
. 10.00.00.

6. AUX Editing

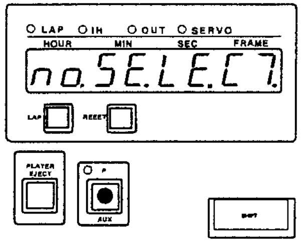
The AUX mode lets you edit directly from an external video source such as a camera using only the recorder. You do not need a player for AUX editing. Follow the steps below to perform AUX editing.

Connect external video source equipment
Activate the AUX mode
Select the editing mode
Register the edit points
Execute preview and actual editing

Connect external video source equipment

Connect the external unit's video output to the recorder's video input.

Activate the AUX mode


LAP
IH
OUT
SERVO
HOUR
MIN
SEC
FRAME
no.SELECT.
LAP
RESET
PLAYER EJECT
AUX
SHIFT

Press the AUX button while holding down the SHIFT key. "NO SELECT" is displayed on the player's time counter.

Select the editing mode

Select the editing mode by pressing the ASSEM key or the appropriate insert key. (Refer to "Editing mode selection" on page 32.)

ASSEM
VIDEO
AUD-1
AUD-2
TC

Register the edit points

Register the recorder's edit points.
(Refer to "Registering edit points" on page 33.)

Execute preview and actual editing

Press the PREVIEW key to preview the edit. Press AUTO EDIT to execute the edit.

PREVIEW
AUTO EDIT

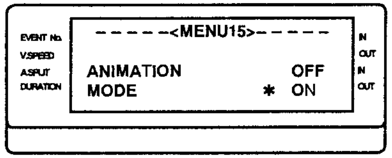
If the animation mode has been activated via the set-up menu, you can continue edits with identical durations simply by pressing the AUTO EDIT key. (Refer to "Configuring The RM-G620U" on page 37 and "Animation Mode" on page 63.)

7. Animation Mode

When you're editing a series of AUX cuts all with the same duration, you can save time by activating the Animation mode. Same-length edits can then be repeated as often as desired simply by pressing the AUTO EDIT key.
The Animation mode is usable only with AUX editing.

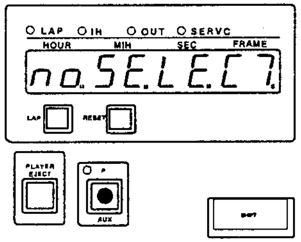
Activating the Animation mode

1. Set <MENU15> "ANIMATION MODE" to ON. (Refer to "Configuring The RM-G820U" on page 37.)


EVENT No.
V.SPEED
ASPLIT
DURATION
IN
OUT
IN
OUT

- - - - - <MENU15> - - - - -
ANIMATION MODE OFF
* ON

Activating the AUX mode


LAP
IH
OUT
SERVO
HOUR
MIN
SEC
FRAME
no.SELECT.
LAP
RESET
PLAYER EJECT
AUX
SHIFT

Press the AUX button while holding down the SHIFT key. "NO SELECT" is displayed on the player's time counter.

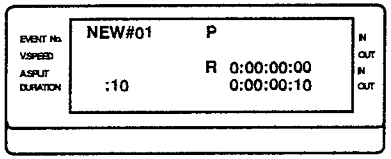
Selecting the editing mode

Select the editing mode by pressing the ASSEM key or the appropriate insert key. (Refer to "Editing mode selection" on page 32.)

ASSEM
VIDEO
AUD-1
AUD-2
TC

Registering edit points

Register the recorder's edit points.
(Refer to "Registering edit points" on page 33.)


EVENT No.
V.SPEED
ASPLIT
DURATION
IN
OUT
IN
OUT

NEW#01 P
R 0:00:00:00
:10 0:00:00:10

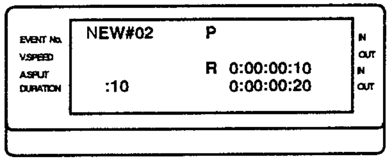
Example

Execute preview and actual editing

Press the PREVIEW key to preview the edit.
Press AUTO EDIT to execute the edit.

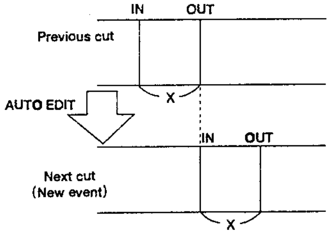
PREVIEW
AUTO EDIT

When one out has been edited, the next cut's edit points are registered automatically as follows.
The edit-in points replace the previous cut


EVENT No.
V.SPEED
ASPLIT
DURATION
IN
OUT
IN
OUT

NEW#02 P
R 0:00:00:10
:10 0:00:00:20

Example


IN
OUT
Previous cut
X
AUTO EDIT
IN
OUT
Next cut
(New event)
X

The edit points for a new event are automatically registered based on the previous cut's event data.

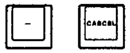
8. Other Functions

Simultaneous cancellation of edit points

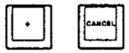
Use the appropriate method below to cancel edit points simultaneously.

Simultaneous edit-in and edit-out point cancellation
Press the Player or Recorder counter RESET button. When the counter switch is set to CTL, this also resets the counter data or lap time displayed on the time counter.

Simultaneous edit-in point cancellation
Press the CANCEL key while holding down the – key. This cancels the edit-in points for both the player and recorder.



Simultaneous edit-out point cancellation
Press the CANCEL key while holding down the + key. This cancels the edit-out points for both the player and recorder.



Simultaneous registration of edit points

Use the appropriate method below to register edit points simultaneously.

Simultaneous edit-in point registration
Press the ENTRY key while holding down the – key. This registers the edit-in points for both the player and recorder.

Simultaneous edit-out point registration
Press the ENTRY key while holding down the + key. This registers the edit-out points for both the player and recorder.

GOTO (Quick search)

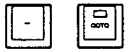
Specified tape positions on the player and/or recorder can be quickly accessed with the GOTO key.

Use the appropriate method below according to the tape position you want to search.

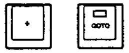
To "GOTO" an edit-in point
Press the GOTO key while holding down the appropriate VCR's IN key. The tape will go to the VCR's edit-in point.

To "GOTO" an edit-out point
Press the GOTO key while holding down the appropriate VCR's OUT key. The tape will go to the VCR's edit-out point.

Simultaneous edit-in point search
Press the GOTO key while holding down the – key. This searches the edit-in points of both the player and recorder.



Simultaneous edit-out point search
Press the GOTO key while holding down the + key. This searches the edit-out points of both the player and recorder.



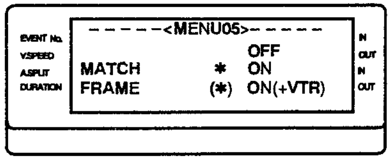
To "GOTO" s program start time
Press the GOTO key while holding down the TOTAL button. The tape position set for the program start time is accessed.

8. Other Functions

Time tracking/ Match-frame function

At the end of automatic editing, time tracking can be used to register a new edit-in point.

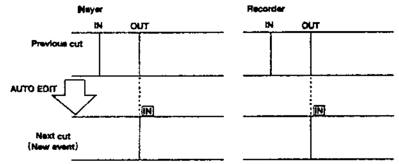
- Set <MENU05> "MATCH FRAME" to ON.



- - - - - <MENU05> - - - - -
OFF
MATCH ✱ ON
FRAME (✱) ON(+VTR)

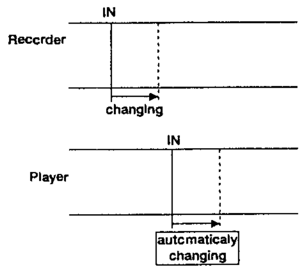
With this setting, the following functions are effective.

Match-frame function
When an edit is executed, the edit-out points (player and recorder) are automatically registered as the edit-in points for the next edit.



The new event's edit-in points for the player and recorder replace the previous event's edit-out points and are registered automatically.

Time track function
When the recorder's edit-in point is changed or re-registered, the player's edit point is automatically changed.

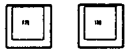


When the recorder's edit-in point is changed, the player's edit-in point is changed automatically.

Manual time tracking

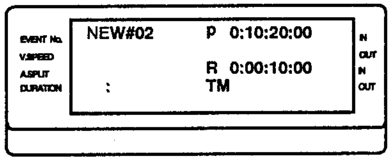
The time track can be activated manually regardless of the setting of <MENU05>"MATCH FRAME".

- Press the IN keys of the player and recorder simultaneously.



- If the recorder's edit-in point is changed, the player's edit points are changed automatically.
- To release this function, press the IN keys of the player and recorder simultaneously.

When the time track is activated, "TM" appears on the LCD event display.



NEW#02 P 0:10:20:00
R 0:00:10:00
: TM

Example

8. Other Functions

News Edit

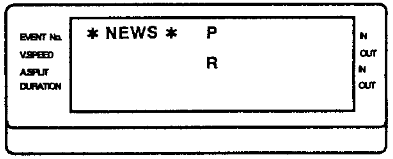
Ideal for editing ENG material, the News Edit function makes editing faster and simpler.

- **Edit-in point registration**
  Locate the edit-in point with the VCR's search/jog dial, then press the PREVIEW key or AUTO EDIT key. The ENTRY operation is not necessary.
- **To "GOTO" an edit-in point while preview or actual editing**
  While preview or actual editing, press the ALL STOP key. The GOTO operation is not necessary.
- **Changing the edit-in point**
  Locate the edit-in point with the search/jog dial on each VCR and change it. Canceling or re-registering the edit-in point is not necessary.

The following functions are not available in the news edit mode:
- Multi-event editing
- Ripple, renumber
- Audio-split editing

Preparation

1 **Engage the News Edit mode.**
Set the rear-panel dip switch 1-8 to ON.
News Edit mode indication is displayed in the LCD's event display.



Editing

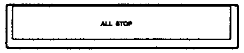
1 **Select the Editing mode.**

ASSEM
VIDEO
AUD-1
AUD-2
TC

2 **Locate the edit-in point with the search/jog dial on the player or the recorder.**
3 **Execute preview.**
Press the PREVIEW key.

Preview editing is executed. The searched tape position is considered the edit-in point.

4 **End preview.**
Press the ALL STOP key.



The tape position is automatically reset to the edit-in point.

8 **Change the edit-in point.**
Locate the new edit-in point with the VCR's jog/search dial.
Press the PREVIEW or AUTO EDIT. The searched position is considered the edit-in point.

8 **Execute editing.**

Editing is executed. The tape position searched with the jog/search dial is considered the edit-in point.

7 **End editing.**
Press the AUTO EDIT key again.

The position where the AUTO EDIT key is pressed is considered the edit-out point and editing ends. The VCR stops one frame before the edit-out point.

- When the ALL STOP key is pressed during editing, editing is interrupted. As a result there may be some signal disturbance at that point.
- If the rear-panel dip switch 1-4 is set to ON when the ALL STOP key is pressed during editing, editing ends in the same way as when the AUTO EDIT key is pressed.

Note:
Even if edit points have been registered beforehand, editing can be performed in the news edit mode. In this case, first register the edit-out point, and then search or register the edit-in point.

Chapter 8
Using The 19-Key Keypad

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2. Numeric Input 70
   Using the scratch pad area 70
   Omitting numeric input 70
   Calculations 70
   Frame input 71
   How to input V.SPEED 71
   Tape search based on numeric input 71
3. Preset the time code/ user bits 72
4. Program Play Mode 74
5. Set-up Menu Switch Setting 75
6. Direct trim function 75

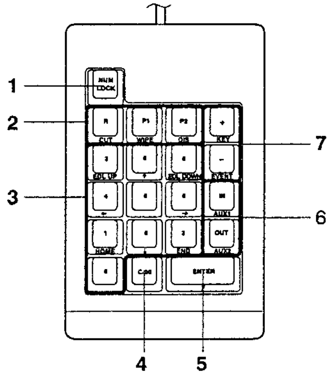
8. Using The 18-Key Keypad

1. Names And Functions Of Keys

Connecting the optional 10-key keypad (SA-K60U) to the RM-G820U simplifies operations where numeric input or cursor movement is required. This chapter shows you how to use the keypad to carry out various operations on the RM-G820U.

Each key on the keypad has two functions — the primary function is inscribed on the top of the key, the secondary function on the front of the key. Primary functions can be activated simply by pressing the key. Secondary functions can be activated by pressing the key together with the SHIFT key or by pressing the key alone when the number lock function has been activated. The functions described on this page are primary functions.

Primary (key-top) functions

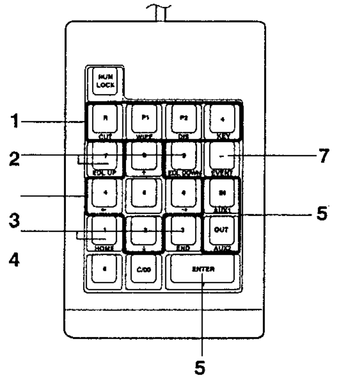


1. **[NUM LOCK] Number lock key**
   When this key is pressed down to the lock position, the secondary key functions (inscribed on the front of the keys) can be activated simply by pressing the desired button. Pressing NUM LOCK again releases the lock to allow primary functions to be used.
2. **[R]/[P1]/[P2] VCR select keys**
   Depending on the engaged RM-G820U operation mode, the following functions are activated.
   In normal editing
   [R]: Recorder is selected and the cursor on the LCD event display moves to the recorder's IN point display section.
   [P1]/[P2]: Player is selected and the cursor on the LCD event display moves to the player's IN point display section.
   When data is input in the scratch pad area, the corresponding tape position can be accessed on the selected VCR.
   In the user bits preset mode, hexadecimal numbers can be input. (Refer to "Preset the time ccde/ user bits" cn page 72.)
3. **[0] to [0] Numeric keys**
   Press to input numeric data.
4. **[C/00] Clear/06 key**
   Press to clear the numeric data displayed in the scratch pad area. This key can also clear an error message. Pressing this key while holding the down the SHIFT key automatically enters "00".
5. **[ENTER] Enter key**
   Press to enter data (numeric data or menu settings) in memory. This key is also used to move numeric data into the scratch pad area. (Refer to "Numeric Input" on page 70.)
6. **[IN]/[OUT] In/Out keys**
   Press either key to move the cursor to the IN or OUT point display on the LCD event display.
   Use the VCR select keys to select the player cr recorder.
   Pressing the IN and OUT keys together moves the cursor tc the DURATION display.
   In the user bits preset mode, the hexadecimal number "P" can be input using the IN key. (Refer to "Preset the time code/ user bits" cn page 72.)
7. **[+]/[–] Plus/minus keys**
   Press to specify the + or – sign with numeric data.
   These keys are also used for doing calculations in the scratch pad area. (Refer to "Numeric Input" on page 70.)
   In the time code preset mode, use these keys to select the drop frame or non-drop frame mode. (Refer to "Preset the time code/ user bits" on page 72.)
   In the user bits preset mode, hexadecimal numbers can be input. (Refer to "Preset the time code/ user bits" on page 72.)

---

1. Names And Functions Of Keys

Secondary (key-front) functions



The functions described on this page are available when a key is pressed after locking the NUM LOCK key. The same functions are also available when the key is pressed while holding down the RM-G820U's SHIFT key.

1. **[CUT]/[WIPE]/[DIS]/[KEY] Effect setting keys**
   These keys cannot be used with the RM-G820U. An error message is displayed when any of these keys is pressed.
2. **[EDL UP]/[DOWN] EDL up/down keys**
   Press to select event data registered in the EDL memory.
   [EDL UP] : Displays events in ascending order.
   [EDL DOWN] : Displays events in a descending order.
3. **[←]/[→]/[↑]/[↓]: Arrow keys**
   Press one of these keys to move the cursor or select menus or menu items.
   [←] / [→] : The cursor on the LCD event display moves in the direction shown by the arrow.
   Pressing either key while a menu is displayed changes the menu number.
   [↑]/[↓] : Moves the cursor in the indicated direction. Pressing either key while a menu is displayed allows to select a menu item.
4. **[HOME]/[END] Home/end keys**
   Press to display the first or last event registered in the EDL memory.
   [HOME] : Displays the first event.
   [END] : Displays the last event.
5. **[F] Prame key**
   Press to activate the frame input mode. "F" is displayed in the first column on the recorder's time counter, indicating that the frame input mode has been activated. (Refer to "Frame input" on page 71.)
6. **[AUX1]/[AUX2] AUX select keys**
   Press either key for AUX editing. (Refer to "AUX Editing" on page 62.)
7. **[EVENT] Event key**
   Press to move the cursor to the LCD's EVENT No. display.

2. Numeric Input

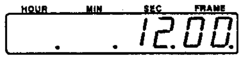
You can use the keypad to directly enter numeric editing data. First select the item, then input the desired numeric value. (Refer to "EDL Management" on page 47.)

Using the scratch pad area

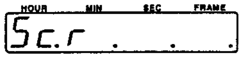
The recorder's time counter is used as the scratch pad area for numeric value input. Numeric data can be kept in the scratch pad area temporarily for checking and calculations prior to entry.

1. **Enter numeric data in the scratch pad area using the numsric keys.**

The recorder's time counter shows the input numeric data.



The player's time counter shows "Scr".



2. **Preas the ENTER key.**

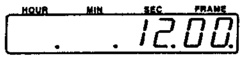
The numeric data displayed in the scratch pad area moves to the cursor position and the data is entered in the memory.

Omitting numerio input

When the curscr in the edit pcint display is blinking, the time data there can be read intc the scratch pad area without using the numeric keys.

1. **Press the ENTER key.**

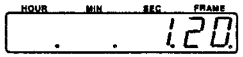
The time data with blinking cursor cn the edit point displey is displayed in the scratch pad area.



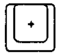
Calculations

Addition or subtraction of editing data is possible.

1. **Input numeric data in the scratch pad area.**



2. **Press the + or – key of the 10-key keypad.**

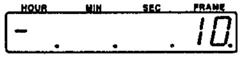


+: Activates the addition mode.

–: Activates the subtraction mode.

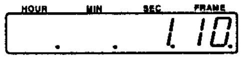
3. **Preas numeric keys.**

The input numeric data is displayed in the scratch pad area.



4. **Press the ENTER key.**

The calculation result is displayed in the scratch pad area.



5. **When moving tha oaloulation results from the soratch pad area, press the ENTER key again.**

The calculation result moves to the position where the cursor is blinking.

2. Numeric Input

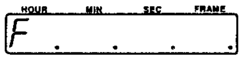
Frame input

Numeric data can be input in frame units (1 sec. = 30 frames).

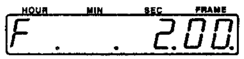
1. **Lock the NUM LOCK key and press the ENTER key.**

NUM LOCK
ENTER

The Frame input mode indication appears in the scratch pad area.



2. **Press the NUM LOCK key again to release this function.**
3. **Input numeric dsta. (1 second = 30 frames)**



200 framea

4. **Press the ENTER key.**

The frame data in the scratch pad area is converted intc normal time data and is moved tc the position where the cursor is blinking.
The frame input mede is deactivated automatically.

How to input V.SPEED

V.SPEED data can be set via numeric input.

1. Press the V.SPEED button. The indicator lights up.
2. Input data with the numeric input keys.

> When inputting the data using the 10-key keypad, press the V.SPEED button so that the indicatcr is lit.
> When <MENU14> "PROGRAM PLAY MODE" is set to ON, V. SPEED data should be set via numeric input.
> (Refer to "Configuring The RM-G820U" on page 37.)

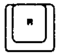
Tape search based on numeric input

The tape position corresponding to the time data input in the scratch pad area can be searched as follows.

1. **Uaing the numeric keys, input the time data fcr the tape position you want to aearch.**
2. **Select the VCR.**

P1: Player.

P2: Player.



R: Recordar.

3. Preset the time code/ user bits

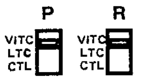
Time code or user bits can be preset on the VCR's built-in time code generator.
The 10-key keypad is required to set these data.

Presetting is performed as follows:

1. **Select the time code type**
2. **Preset the time code user bits**

Select tbe time code type

Set the time counter switches to VITC or LTC according to the type of time code used with the VCRs' time code generators/readers.


P
R
VITC
LTC
CTL
VITC
LTC
CTL

Preeet the time code/ user bits

1 Set the time code generator to the preset mode.

For the BR-S800U, set the menu No. "TCG SELECT" to PRESET.
When starting to record with preset data, set the time code generator to REC RUN. However, when editing, set it to FREE RUN.

2 Set the RM-G820U to the preset mode.
Set rear panel DIP SW1-1 to ON.
(Refer to "Rear-Panel DIP switches" on page 44.)

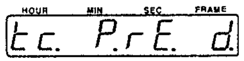
To transfer time code data:
Press the REC EE key while holding down the SHIFT key.

SHIFT
REC EE

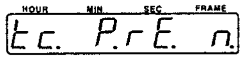
The mode is displayed in the player's time counter.To cancel the preset mode, press the ALL STOP key.

> If numeric data is input in the scratch pad area before this operation, this data is transferred to the VCR as preset data.

Drop frame mode


HOUR
MIN
SEC
FRAME
tc. P.r E. d

Non-drop frame mode


HOUR
MIN
SEC
FRAME
tc. P.r E. n

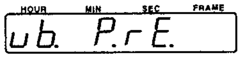
Select the drop frame or non-drop frame mode.
Press the + key to engage the drop frame mode.
Press the - key to engage the non-drop frame mode.

To transfer the user bits
Press the LAST ED key while holding down the SHIFT key.

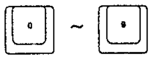
SHIFT
LAST ED

> If numeric data is input in the scratch pad area before this operation, this data is transferred to the VCR as preset data.

The mode is displayed in the player's time counter.To cancel the preset mode, press the ALL STOP key.

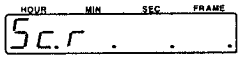

HOUR
MIN
SEC
FRAME
ub. P.r E.

3. **Enter the desired data.**

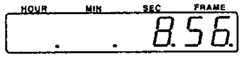


The input data is displayed on the scratch pad area.

Plsyer side


HOUR
MIN
SEC
FRAME
Sc.r . . .

Recorder side


HOUR
MIN
SEC
FRAME
. . 8.5 6.

Inputs of hexadecimal numbers from A to F are performed with the following keys.

Input data	A	B	C	D	E	F
	↓	↓	↓	↓	↓	↓
Used key	R	P1	P2	+	–	IN

3. Preset the time code/ user bits

4 **Transfer input data to the VCR by pressing the ENTER key.**

6 **Register the preset data.**
Press the PLAY and REC keys simultaneously.

Recording starts from the preset data.

6 **Recording ends.**
Press the ALL STOP key.

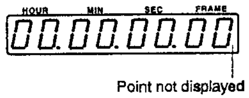
> When editing using time code, engage the time code generator in the PRESET mode and set it to FREE RUN.

Display of non-drop frame and drop frame modes

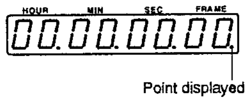
- The drop frame mode is indicated on the time counters by a point. No point appears if the non-drop frame mode is engaged.

Tima counter

Non-drop frame mode


HOUR
MIN
SEC
FRAME
00.00.00.00
Point not displayed

Drop frame mode


HOUR
MIN
SEC
FRAME
00.00.00.00.
Point displayed

- On the LCD's edit point display, a colon (:) indicates the non-drop frame mode and a semicolon (;) indicates the drop frame mode.

Edit point diaplay.

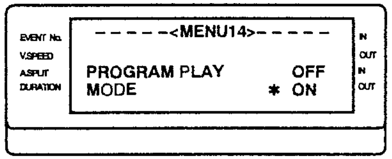
Non-drop frame mode
00:00:00:00

Drop frame mode
00;00;00;00

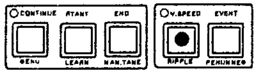
4. Program Play Mode

The Program Play mode lets you adjust playback speed in 0.1% steps within a range of 80% to 120% of the normal playback speed.To use this function, you will need the optional 10-key keypad (SA-K80U) and a VCR with Program Playback capability (such as the BR-S525U).

1. Open the set-up menu 14 and set the "PROGRAM PLAY MODE" to ON. (Refer to "Configuring The RM-G820U" on page 37.)

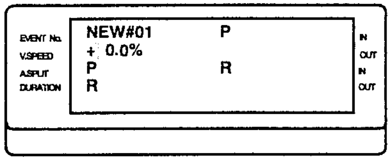


2. Press the V. SPEED button.

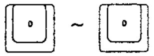


The indicator lights and the cursor moves to the V.SPEED display on the LCD event display.

Example

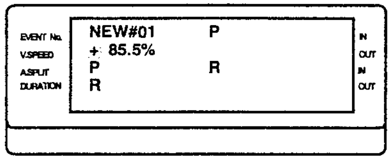


3. Input the speed data.
   Input numeric data in the range of 800 to 1200 using the 10-key keypad. It is not necessary to input a decimal point.



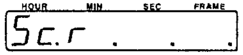
The last number input falls to the right of the decimal point.
Data is significant down to the first decimal place.

Example

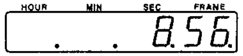


The input data is displayed in the scratch pad area. (Refer to "Using The 10-Key Keypad" on page 67.)

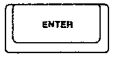
Player side



Recorder side

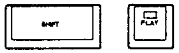


4. Enter the speed data in memory.
   Press ENTER.



The input data appears on the V. SPEED display and the speed data is registered in memory.

5. Press the player's PLAY key while holding down the SHIFT key.



The Program Playback-capable VCR starts playback at the registered speed.
ed data.

Using the program play mode in editing

The playback speed set in the Program Play mode can be used in automatic editing. However, the Program Play mode cannot be used if the motion memory is also in use.

5 Set-Up Menu Switch Setting

The following set-up menu-related operations can be performed using the optional 10-key keypad. Other operations should be done on the RM-G820U. (Refer to "Configuring The RM-G820U" on page 37.)

Select the menu switch you wish to set
Change the setting
Enter the setting

Select the menu switch you wish to set

1. Hold down the SHIFT key of the RM-G820U and press the MENU button to display the set-up menu.
2. Press the NUM LOCK key to the lock position and press the → or ←key.
   Each time these keys are pressed, the menu changes.
   The same operation can be performed by holding down the SHIFT key in place of the NUM LOCK key.

Change the setting

1. Hold down the NUM LOCK key to the lock position and press the ↑or ↓ key.
   Each time these keys are pressed, the * mark is moved.
   The same operation can be performed by holding down the SHIFT key in place of the NUM LOCK key.
   To change the numeric data for menus 01, 07 and 08, input the data using the numeric keys.

Enter the setting

Press the ENTER key. The new setting will be stored in memory.

6 Direct trim function

This function simplifies the changing of edit points.

1. **Set the rear-panel's DIP switch 1-7 "Auto cleanup/direct trim" to ON.**
2. **Select the edit point to be changed using the IN or OUT keys.**
3. **Input the frame number to be changed in the scratch pad area.** (Refer to "Using the scratch pad area" on page 70.)
   Before entering numeric values, specify the direction (to advance or reverse a frame) using the + or - key.
   + key: to advance a frame.
   - key: to reverse a frame.
4. **Press the ENTER key.**
   The changed edit point data is displayed in the scratch pad area.
   Note:
   When the direct trim function is set to OFF, the entered value is displayed in the LCD event display as edit point data.
5. **Press the ENTER key again.**
   The changed edit data is displayed in the LCD event display.

When an unregistered edit point (edit point for which the edit-IN or edit-OUT point display is not lit) is selected and the direct trim function is used, the following operations take place.
- When the OUT point is selected
  Based on the corresponding IN point on the VCR, the correction for input data is performed and registered as the OUT point. However, only the + key (to advance a frame) has any effect.
- When the IN point is selected
  Based on the corresponding OUT point on the VCR, the correction for input data is performed and registered as the IN point. However, only the - key (to reverse a frame) has any effect.

Chapter 9
Supplomontary Information

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9. Supplementary Information

1. Error Messages

Error messages warn you of operational or setting problems. These messages appear on the LCD event display or time counters when appropriate. Explanations of the messages are given below. Either English or Japanese can be selected as the LCD's display language. (Refer to "Ccnfiguring The RM-G820U" on page 37.)

Display		Remedy
<ERR.01>	VTR LOCAL!	Set the remote switch to REMOTE.
<ERR.02>	VTR NO CON.!	Connect the remote cable. Turn the VCR
<ERR.03>	TAPE EJECTED!	Load a video cassette into the VCR.
<ERR.04>	CANNOT READ TC!	When the VCR doesn't have a built-in time code reader, set the counter switch to CTL.
<ERR.05>	BUMP ERROR!	If the tape has discontinuous signals in the middle, set set-up menu 02 "SYNC GRADE" to ROUGH. When the player and recorder are different models, activate the learning function. (Refer to "Preparing the editing system" on page 26.)
<ERR.06>	DIFINE EDIT MODE!	Select the edit mode. (Refer to "Edit mode selection" on page 32.)
<ERR.07>	CANNOT USE THIS FUNCTION!	•The CUT, WIPE, DIS and KEY keys on the optional 10-key keypad are not usable with the main unit •The RIPPLE function does not work when an event containing speed data stored in the motion memory is registered in the EDL event memory.
<ERR. 08>	DURATION = 0F!	Set the duration to 1 frame or more when re-registering or correcting edit points. (Refer to "Registering edit points" on page 33 and "Changing or correcting edit points" on page 34.)
<ERR.09>	PLAYER NOT SELECTED!	• The player cannot be operated from the RM-G820U in the AUX mode. Press the P button to release the AUX mode.
<ERR.10>	SERVO LOCK ERROR!	• Set a longer preroll time. • Check for signal distortion on the preroll section of the tape.
<ERR. 11>	VT SPEED OVER 300%!	Set the V.SPEED to less than 300% when re-registering cr correcting edit points. (Refer to "Set the playback speed" on page 57.)
<ERR.12>	VT SPEED OVER -200%!	Set the V.SPEED to more than -200% when re-registering or correcting edit peints. (Refer to "Set the playback speed" en page 57.)
<ERR.13>	DIFINE AUDIO MODE!	Select the audio insert key (AUD-1, AUD-2).

9. Supplementary Information

1. Error Messages

Display		Remedy
<ERR.14>	VTR NO PLAY ERROR!	Check the following points. • If the VCR is in the warning mode. - In this case, refer to the VCR's instruction manual and follow the remedy. • If the tape reaches its end. • If the editing is performed in the 3x mode using the BR-S800U. - In this case, perform the edit in the standard mode.
<ERR.15>	CANNOT RECORD!	Check to see if the cassette's tab is broken. Check to see if the RECORDING INHIBIT of the VCR's set-up menu is set to ON. When the BR-S800U is used, check the setting of menu No. 304.
<ERR.18>	TC DATA JUMP ERRORI	Use a tape with continuously recorded time code.
<ERR. 17>	IN/OUT REVERSED!	Set the duration to more than 1 frame when re-registering or correcting edit points. (Refer to "Registering edit points" on page 33 and "Changing or correcting edit points" on page 34.) • When using variable-speed motion control in automatic editing, match the player's duration with the V.SPEED mode.
<ERR. 18>	IN/OUT NOT ENOUGH!	Register edit point which has not been registered. (Refer to "Registering edit points" on page 33.)
<ERR.19>	START/END REVERSEDI	• Specify the first and last events again for multi-event editing.
<ERR.20>	EVENT FULL! <MENU11>OVERWR:INH.	• If you need to overwrite event data registered in the EDL event memory, set set-up menu 11 "OVERFLOWED EDIT" to "OVERWR".
<ERR. 21>	EVENT MEMORY INH. <MENU04>EVENT :INH.	Set <Menu04> "EVENT MEMORY" to ON. (Refer to "Set-Up Menu Switch Setting" on page 39.)
<ERR.22>	MOTION MEMORY FULL! (MAX=7)	Delete the most recently-registered event which used motion memory. Cancel the setting for V. SPEED. When set-up menu 04 "EVENT MEMORY" is set to OFF, you can use motion memory as many times as required. However, event data cannot be registered in the EDL event memory.
<ERR.23>	CABLE NO CONN.! (MAINCPU PWB CN1/2)	Internal problem. Consult your JVC dealer.
<ERR.24>	CANNOT PREVIEW ON CONTINUE MODEI	Multi-event editing cannot be previewed. Press AUTO EDIT to execute the multi-event editing.

2. Troubleshooting

Symptom : Editing does not start.

Cause : No CTL signal has been recorded on the tape being used for recording.
Remedy : Record CTL signals at the beginning of the tape for a period exceeding the preroll time.

Symptom : Editing is interrupted.

Cause : The CTL signal is not recorded continuously.
Remedy : Record the tape again so that the CTL signal is recorded continuously.

Cause : The beginning of tape is reached during prerolling.
Remedy : Reset the edit-in point. Be sure to set it at a point that exceeds the preroll time.

Cause : When time code-referenced editing is being performed, the time code is not continuous.
Remedy : Perform editing based on the CTL signal.

3. Glossary

CTL
Abbreviation for *control* signal. Tapes recorded in the VHS format have a separate control track. During recording, one CTL pulse per picture frame is recorded on the control track.

CTL time code
Time code based on the CTL signal. Data is expressed in binary form ("0" and "1") by varying the CTL signal pulse width. About 80 bits are combined to represent an absolute address and user bits.

E-E
Electric-to-Electric. Refers to the video and audio signals obtained after the signals are input to a VCR and output from the electric circuitry inside it, rather than from tape playback.

GPI
General-Purpose Interface.
The GPI output signals can be used to control equipment (video switcher, audio mixer, SFX generator, etc.) equipped with GPI input jacks.

LTC
Longitudinal Time Code. This type of time code is recorded in the longitudinal direction of tape. With professional S-VHS VCRs, normal audio track 2 is usually used as the LTC track.

VITC
Vertical Interval Time Code. This type of time code is recorded in the video signal's vertical blanking interval.

Assemble editing
An editing technique which simultaneously replaces all existing signals (CTL, video, and audio) with new signals. Because the previous recording is erased with the full-width erase head, images at edit transitions may be disturbed. Assemble editing is normally used when editing selected cuts in sequential order.

Insert editing
An editing technique which allows insertion of selected signals into an existing recording. The previously recorded CTL signal is used as a guide and only the previous video and/or audio signals are replaced. Because the previous recording is erased track by track with the rotary erase head, there is no disturbance at edit transitions. This makes insert editing the preferred editing technique even when insertion of new material into a previous recording is not required.

Preroll
VCRs require a few seconds to stabilize transport after the tape starts. To ensure a stable image in editing, the tape is started a few seconds before the actual edit-in point. This is called "prerolling".

Postroll
After an edit is executed, tape transport continues for a short distance past the edit-out point. This is called "postrolling".

User bits
Within each unit of the time code signal, space is reserved for registration of user-specified data or "user bits". With SMPTE time code, 8 data bits using hexadecimal numbers from 0 to F are allocated as user bits. With CTL time code, 4 data bits using hexadecimal numbers from 0 to F are allocated as user bits.

Time code
The absolute tape position information recorded on tape. The standard time code in the video/audio industry is the SMPTE/EBU time code.

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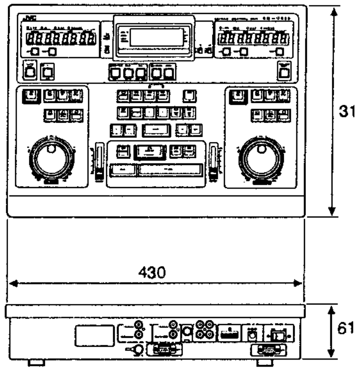
Chaptor 10 Specificatioos

- ■ **Power supply** .... DC 9V
- ■ **Power consumption** 8W
- ■ **Dimensions** (WxHxD) ... 430 x 81 x 310 mm
- ■ **Weight** 4.5Kg
- ■ **Permissible operating temperetures 5 to 40 ° C**
- ■ **Permissible storage temperaturea –20 to 60 ° C**
- ■ **Permissible oparating humidity 30% to 80%RH**
- ■ **VCR control operations**
  Play, Record, FF, Rewind, Still, VMC (Variable-Speed Motion Control), Program Play mode, search, eject, search ring/jog dial
- ■ **Editing modes**
  Assemble, Insert (VIDEO/Hi-Fi, AUD-1, AUD-2, TC)
- ■ **Editing refarance**
  Time code or CTL pulse
- ■ **Grade of editing synchronization**
  - LTC/VITC time code reference, capstan bump ON: +/–0 frame
  - CTL reference, capstan bump ON: +/–2 frames (depending onVCR)
- ■ **Preroll time**
  - Selection from 3, 5 and 7 seconds
  - Set-up menu setting from 1 to 59 seconds
- ■ **Memory**
  - Event memory 98 events
  - Motion memory 7 events
- ■ **Connectors**
  - 9P RS-422
    9-pin serial interface. connector.
  - SYNC IN 0.2V to 5.0Vp-p, 75 ohms, unbalanced (BNC)
  - GPI output jacks RCA X4
    Open-collector output
    Variable-timing outputs x 4. (Edit-in point +/–59 sec. 29 frames except for GPI-4 with a timing range of +/–30 frames.)
    Manual take possible
  - Audio monitor jacks
    INPUT RCA X2
    OUTPUT RCA X2
  - 10-koy keypad connoctor
- ■ **Display panels**
  - Time counters
    LED 8-digit.
    CTL reference operation: –9 hr. 59 min. 59 sec. 29 frames to 9 hr. 59 min. 59 sec. 29 frames, or 0 hr. 0 min. 0 sec. 0 frame to 23 h. 59 min. 59 sec. 29 frames (depending on VCR)
    Time code reference operation: 0 hr. 0 min. 0 sec. 0 frame to 23 h. 59 min. 59 sec. 29 frames
    User's bits: 00000000 to FFFFFFFF (with SMPTE time code operation)
    IN point, OUT point, duration, lap time, TOTAL time,SPLIT time, VMC speed, error message
  - LCD event display
    Event data, menu setting, error messages
- ■ **Accessory**
  AC power adapter
  Power cord
- ■ **Optional accaasory**
  SA-K60U (10-key keypad)
  SA-66U (Rack mount adapter)
  9PIN remote cable
- ■ **Dimension diagram**



unit:mm

Design and specifications subject to change without notico.

RM-G820U INSTRUCTIONS

JVC®

VICTOR COMPANY OF JAPAN, LIMITED

Printed in Japan
SL96025

SECTION 1
GENERAL DESCRIPTION AND DISASSEMBLY

1. 1 REMOVAL OF EXTERNAL COVERS

Note : Before disassembling the set, make sure that the power cable is disconnected from the power outlet.

Part to Remove	Screw to Remove	Remarks
Operation panel assembly (Fig. 1-1-1)	Ⓐ(4 screws) total : 4 screws	• Remove four screws Ⓐ, and lift up the operation panel assembly. • Remove the connectors connected to CN1 and CN3 on the MAIN CPU board. Now you can separate the operation panel assembly from the bottom cover assembly.
Search／Jog dial (Fig. 1-1-2)	Ⓑ(1 screw), Ⓒ(3 screws) total : 4 screws	• Match the center (orange mark) of the Search dial with the knob on the Jog dial. • Insert a hex key (1.5mm) into the hole on the opposite side of the orange mark on the Search dial, and loosen setscrew Ⓑ holding the Jog dial in place. • Remove the Jog dial, and remove three screws Ⓒ holding the Search dial in place. *Note : Before attaching the Search dial with screws Ⓒ, apply a coating of Screw Tight on approximately 1mm of the tip of the screw to prevent the screw from becoming loose.* • Lift up and remove the Search dial. *Note : When attaching the Search dial, carry out the following to check functions after attaching the Jog dial.* ① *Make sure that the Jog dial rotates smoothly (without contacting the Search dial).* ② *Make sure that the weight of the knob does not prevent rotation of the Jog dial when the oparation panel assembly is set vertically, and the Jog knob is moved at an angle to the right.* *Note : When replacing the Search dial with a new dial (PRD31052A-06) on the RM-G820U (up to machine No. ××××0059), a black spacer is sometimes inserted onto the shaft of the Search／Jog control assembly from being attached. Remove this spacer before attaching the assembly.*
Search／Jog control assembly (Fig. 1-1-2)	Ⓓ(4 screws) total : 4 screws	• Separate the operation panel from the chassis, and remove the Search／Jog dials. (See description above.) • Remove four screws Ⓓ. • Remove the connectors connected to the Search／Jog control board assembly. ***Note :*** *When attaching the Search／Jog board assembly, highly accurate (positional) adjustment is needed. So, try not to remove the Search／Jog board from the Search／Jog control assembly.*

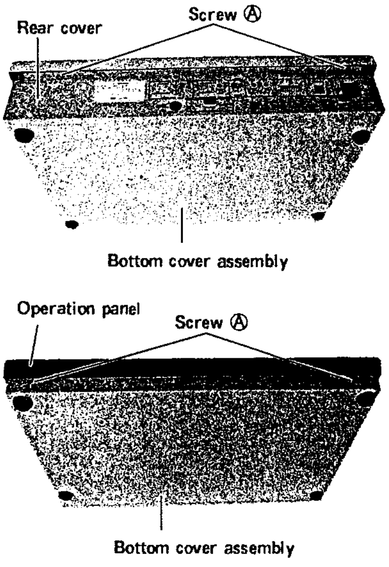

Rear cover
Screw Ⓐ
Bottom cover assembly
Operation panel
Screw Ⓐ
Bottom cover assembly

Fig. 1-1-1 Removing the Operation Panel assembly

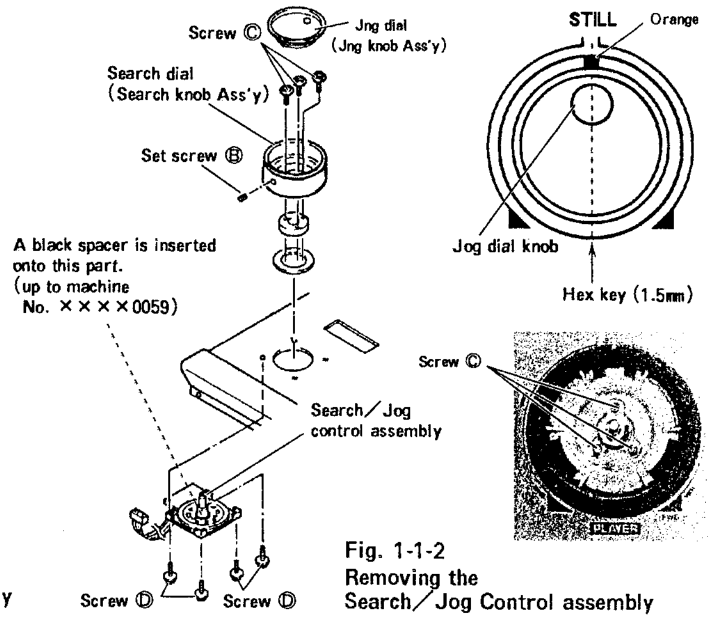

Screw Ⓒ
Jog dial
(Jog knob Ass'y)
Search dial
(Search knob Ass'y)
Set screw Ⓑ
A black spacer is inserted onto this part.
(up to machine No. ××××0059)
Search／Jog control assembly
Screw Ⓓ
Screw Ⓓ
STILL
Orange
Jog dial knob
Hex key (1.5mm)
Screw Ⓒ
PLAYER

Fig. 1-1-2 Removing the Search／Jog Control assembly

1. 2 REMOVING THE MAIN BOARDS

Note : • When removing/installing any circuit board, cut off the power supply beforehand.
• Make sure to reinstall any circuit board removed once as it was.

Board Name	Remarks
[0][2] Operation board assembly (Fig. 1-2-3)	1. Hold and remove the MONITOR control knobs on the operation panel. 2. Separate the operation panel from the chassis. (See. 1.1) 3. Remove 15screws Ⓐ from the operation board. 4. Slightly lift up the operation board assembly, and remove the connectors connected to CN2 to CN5 on the operation board assembly.
Operation display board assembly (Fig. 1-2-3)	1. Separate the operation panel from the chassis. (See. 1. 1) 2. Remove the connectors connected to CN2 and CN3 on the operation board assembly. 3. Remove four screws Ⓑ from the operation display board assembly.
[0][3] Rear-1 board assembly (Fig. 1-2-4, 1-2-5)	1. Separate the operation panel from the chassis. (See. 1.1) 2. Remove the two flat cables connected to CN1 and CN2 on the REAR-1 board assembly. 3. Remove three screws Ⓒ and Ⓓ, respectively, from the rear panel. ***Note :*** ***The bracket on the REAR-1 board assembly is held in place by two screws.***
[0][1] MAIN CPU board assembly (Fig. 1-2-5, 1-2-6)	1. Separate the operation panel from the chassis. (See. 1.1) 2. Remove REAR-1 board assembly. 3. Remove the four screws Ⓔ (5mm) holding the 9-pin connector to the rear panel. 4. Remove five screws Ⓕ from the MAIN CPU board.

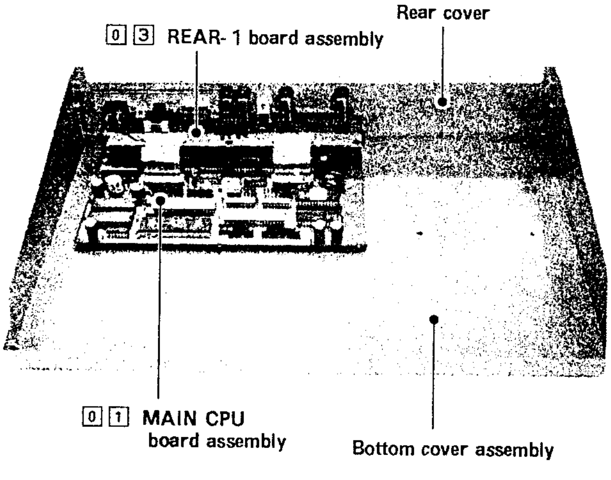

Rear cover
[0][3] REAR-1 board assembly
[0][1] MAIN CPU board assembly
Bottom cover assembly

Fig. 1-2-1 Board Layout (Chassis)

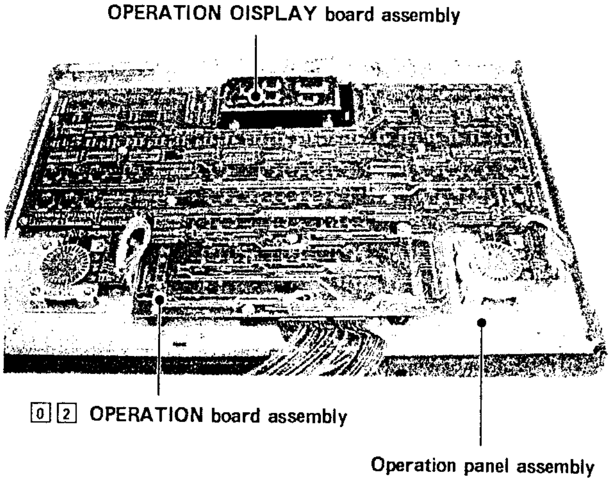

OPERATION OISPLAY board assembly
[0][2] OPERATION board assembly
Operation panel assembly

Fig. 1-2-2 Board Layout (Operation panel)

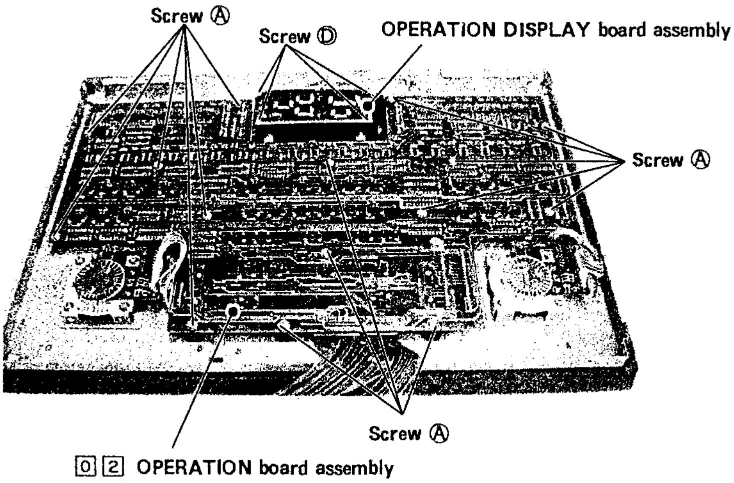

Screw Ⓐ
Screw Ⓓ
OPERATION DISPLAY board assembly
Screw Ⓐ
Screw Ⓐ
0 2 OPERATION board assembly

Fig. 1-2-3 Removing the OPERATION board assembly

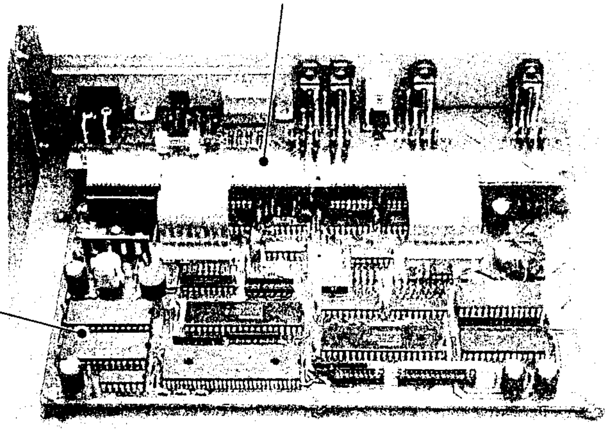

0 3 REAR-1 board assembly
0 1 MAIN CPU board assembly

Fig. 1-2-4 Removing Boards (Bottom)

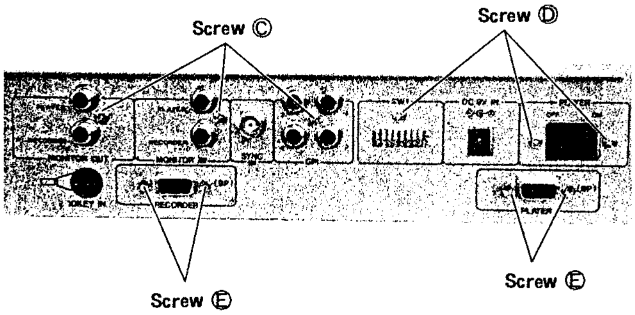

Screw Ⓒ
Screw Ⓓ
Screw Ⓔ
Screw Ⓔ

Fig. 1-2-5 Removing Boards (Rear panel)

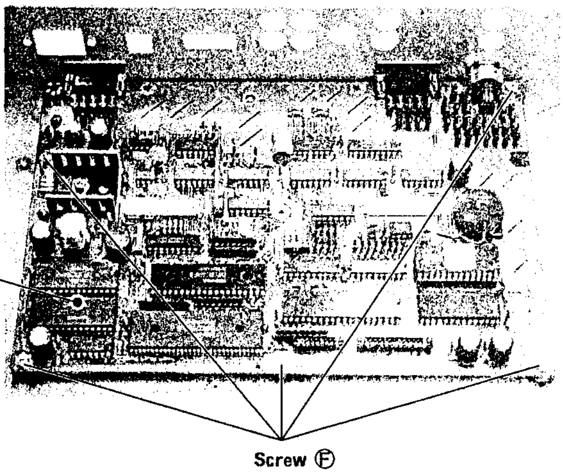
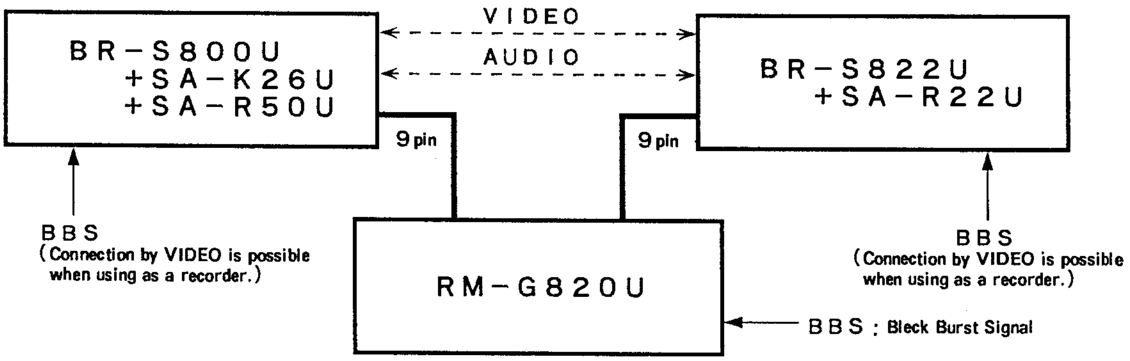

0 1 MAIN CPU board assembly
Screw Ⓕ

Fig. 1-2-6 Removing the MAIN CPU board assembly

1. 3 EDITING SYSTEMS AND EQUIPMENT SETTING

S−VHS	S800 series + S22 series

— Connection example —


VIDEO
AUDIO
BR−S800U
+SA−K26U
+SA−R50U
BR−S822U
+SA−R22U
9 pin
9 pin
RM−G820U
BBS
(Connection by VIDEO is possible when using as a recorder.)
BBS
(Connection by VIDEO is possible when using as a recorder.)
BBS : Bleck Burst Signal

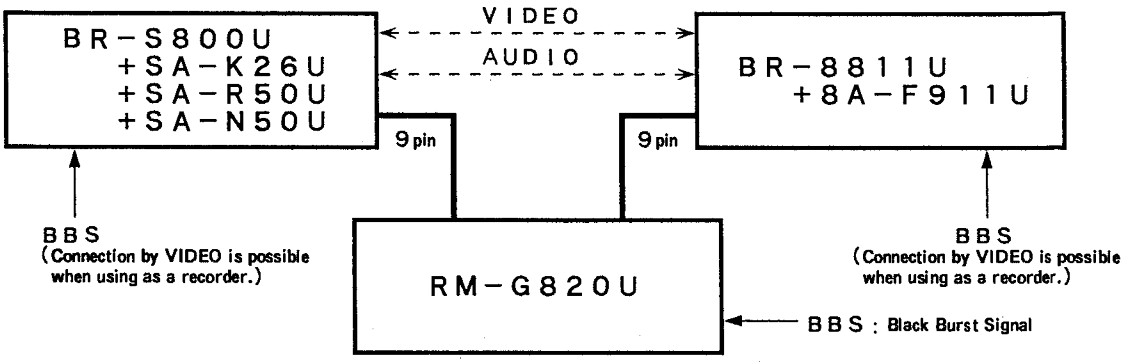
Note :
The on-screen display of the BR-S822U may differ with that of the RM-G820U counter.
So, macth the timer mode of the BR-S822U and RM-G820U counters.

Model	Part to be Operated	Selector Switch · Menu item	Setting
BR−S822U/ BR−S622U/ BR−S522U/ BR−S525U	MENU switch	No.317 9PIN DEVICE ID No.330 VIDEO EDIT DELAY No.331 AUDIO EDIT DELAY	JVC S-VHS1 7 FRAMES 7 FRAMES
	Front panel Front sub panel	REMOTE SYNC	9 PIN EXT
	SA−R22U	FREE RUN/REC RUN REGEN/PRESET INT/EXT VITC REC	FREE RUN PRESET*1 INT ON
BR−S800U/ BR−8500U	MENU switch	No.003 SYNC SELECT No.317 9PIN DEVICE ID No.330 VIDEO EDIT DELAY No.331 AUDIO EDIT DELAY No.337 SLOW MODE No.413 TCG SOURCE No.414 TCG SELECT No.415 TCG MODE No.417 VITC REC No.418 VITC LTC/CTL TC	EXTERNAL JVC S-VHS-1 8 FRAMES 8 FRAMES LINEAR*3 INTERNAL PRESET*1 FREE RUN ON VITC LTC
	Front panel	REMOTE	REMOTE
RM−G820U	MENU switch	MENU 01 PREROLL TIME EDIT TIMINNG MENU 02 SYNC GRADE MENU 18 BUMP SELECT	5 SEC. −7 (−8) FRAME*2 0 F RECORDER

∗1: When not inputting an external synchronizing signal, set to the REGEN mode.
∗2: With the S22 and S800 series, the edit timing is automatically set by the 9PIN DEVICE ID.
−7 FRAME : S822 series
−8 FRAME : S800 series
∗3: This is set when applying bump on the S800 series.
Note : Set switches and MENU switches not listed above to the factory settings.

S−VHS	S800 serics + S11 series

— **Connection example** —


BR−S800U
+SA−K26U
+SA−R50U
+SA−N50U
VIDEO
AUDIO
BR−8811U
+8A−F911U
9 pin
9 pin
RM−G820U
BBS
(Connection by VIDEO is possible when using as a recorder.)
BBS
(Connection by VIDEO is possible when using as a recorder.)
BBS : Black Burst Signal

Note :

1) ***Before starting editing, use the learning function.***
2) ***When using the SA-F911U settings in the "LTC" mode, make sure that LTC measures have been carried out on the S11 series.***
3) ***When not carrying out TC PRESET, use the SA-F911U in the "REGEN (SW3-5)" mode.***
   When using the BR-S800U on the player in the above connection example, install an SA-N50U on the BR-S800U.
4) ***When the SA-F911U ROM version is "Ver. 1-6", the RM-G820U TC mode must be set to either "LTC" or "TC AUTO" when the SA-F911U is set to "VITC"***

Model	Part to be Operated	Selector Switch · Menu item	Setting
BR−S811U/ BR−S611U	Front panel	REMOTE/LOCAL	REMOTE
SA−F911U (VITC)*1	Rear panel	REMOTE	9 PIN
	Front panel DIP switch	SW 1-1 : "OFF" SW2-1 : "ON" SW 1-2 : "ON" SW2-2 : "ON" SW 1-3 : "OFF" SW2-3 : "OFF" SW 1-4 : "OFF" SW2-4 : "OFF" SW 1-5 : "OFF" SW2-5 : "OFF" SW 1-6 : "ON" SW2-6 : "OFF" SW 1-7 : "OFF" SW2-7 : "OFF" SW 1-8 : "OFF" SW2-8 : "ON"	SW3-1 : −(ON)*1 SW3-2 : −(OFF)*1 SW3-3 : − SW3-4 : "OFF" SW3-5 : "ON" SW3-6 : "OFF" SW3-7 : "OFF" SW3-8 : "OFF"
BR−S800U/ BR−S500U	MENU switch	No.003 SYNC SELECT No.317 9PIN DEVICE ID No.330 VIDEO EDIT DELAY No.331 AUDIO EDIT DELAY No.337 SLOW MODE No.413 TCG SOURCE No.414 TCG SELECT No.415 TCG MODE No.417 VITC REC No.418 VITC LTC/CTL TC	EXTERNAL JVC S-VHS-1 8 FRAMES 8 FRAMES LINEAR INTERNAL PRESET FREE RUN ON VITC LTC
	Front panel	REMOTE	REMOTE
RM−G820U	MENU switch	MENU 01 PREROLL TIME EDIT TIMINNG MENU 02 SYNC GRADE MENU 18 BUMP SELECT	5 SEC. − 2 FRAME*2 0 F RECORDER
	DIP switch (MAIN CPU board)	S1-4 TC AUTO/EDIT LAMP FLICKER	ON

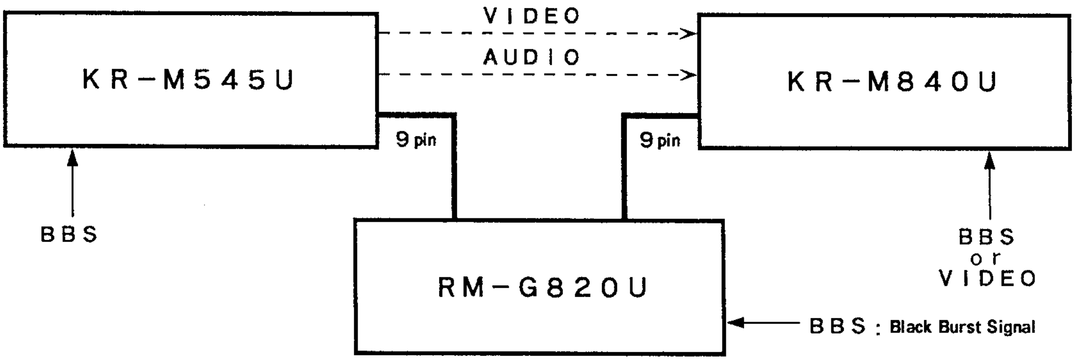
***1: Settings in parentheses are for when the SA-F911U timer mode is set to "VITC".**

***2: With the S11 seriec, the edit timing is automatically set by the 9PIN DEVICE ID.**
−2 FRAME : S11 series

*Note : **Set switches and MENU switchee not listed above to the factory settings.***

M II	KR−M545U + KR−M840U

— Connection example —



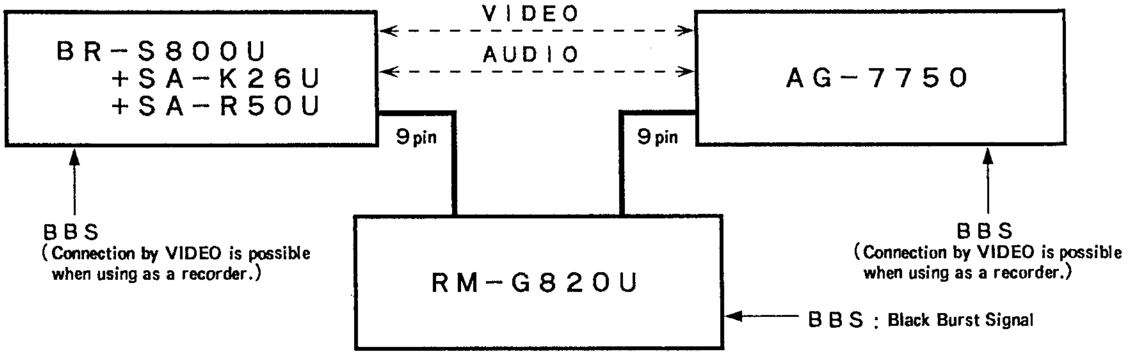
Note :
VITC can no longer be read when the VTR speed is ×1 speed or faster. So, set the TC mode to "LTC" or "TC AUTO".
With slow motion editting of KR-M545U, only the range ×(−1) speed to ×2 speed are supported.
So, when executing program editing, execute within the range ×(−1) to ×2 speed.

Model	Part to be Operated	Selector Switch · Menu item	Setting
KR−M545U	Setup MENU	All item	Set before shipment from factory
	Front panel	REMOTE／LOCAL	REMOTE
KR−M840U	Setup MENU	All item	Set before shipment from factory
	Front panel	REMOTE／LOCAL TC INT／EXT	REMOTE INT
	Inside panel	REMOTE	9 PIN
RM−G820U	MENU switch	MENU 01 PREROLL TIME EDIT TIMINNG MENU 02 SYNC GRADE MENU 18 BUMP SELECT	5 SEC. − 5 FRAME 0 F RECORDER

Note : Set switches and MENU switches not listed above to the factory settings.

S-VHS S800 series + AG-7750

— Connection example —


BR-S800U
+SA-K26U
+SA-R50U
VIDEO
AUDIO
AG-7750
9pin
9pin
RM-G820U
BBS
(Connection by VIDEO is possible when using as a recorder.)
BBS
(Connection by VIDEO is possible when using as a recorder.)
BBS : Black Burst Signal

Note :

If you press the "PREVIEW" button when editing the "ASSEMBLY", the REC E-E mode is canceled on the AG-7750, and PREVIEW operation cannot be checked. If you press an operation button in the REC E-E mode, and REC E-E mode is canceled on the AG-7750 (and the REC EE LED on the RM-G820U does not light).

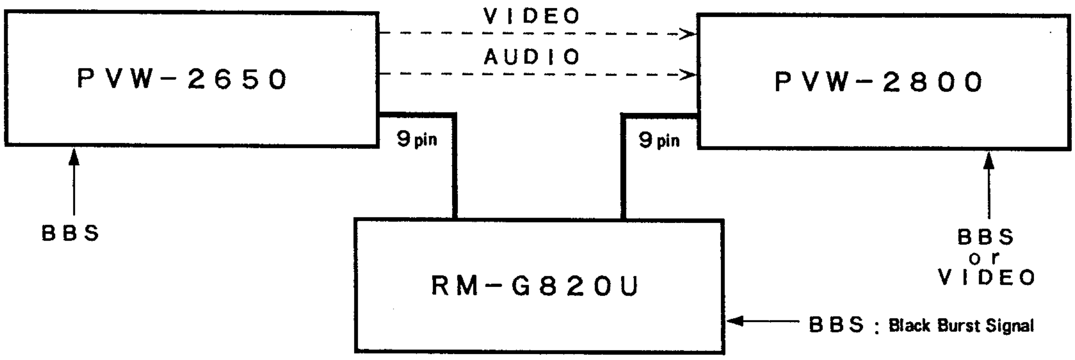
If you set the AG-7750 to the REC E-E mode and then press the "STOP" button, Search dial functions are no longer accepted on the AG-7750. If you set the AG-7750 to the REC E-E mode when editing insert, time code generator values are read, and PREVIEW operation is not possible. If this happens, set the TC GEN switch "REGEN". Also, note that the REC E-E mode cannot be canceled by pressing the "ALL STOP" or "STOP" button after previewing when editing insert.

Model	Part to be Operated	Selector Switch · Menu item	Setting
BR-S800U/ BR-S500U	MENU switch	No.003 SYNC SELECT No.317 9PIN DEVICE ID No.330 VIDEO EDIT DELAY No.331 AUDIO EDIT DELAY No.337 SLOW MODE No.413 TCG SOURCE No.414 TCG SELECT No.415 TCG MODE No.417 VITC REC No.418 VITC LTC/CTL TC	EXTERNAL JVC S-VHS-1 8 FRAMES 8 FRAMES LINEAR INTERNAL PRESET FREE RUN ON VITC LTC
	Front panel	REMOTE	9 PIN
AG-7750	Setup MENU	No.3003 REMOTE OPERATION	9 PIN
	Front panel	CONTROL	REMOTE
	Front sub panel	SYNC SELECT TIME CODE INT/EXT REGEN/PRESET REC RUN/FREE RUN VITC REC	EXT INT REGEN FREE RUN ON
RM-G820U	MENU switch	MENU 01 PREROLL TIME EDIT TIMINNG MENU 02 SYNC GRADE MENU 18 BUMP SELECT	5 SEC. − 8 FRAME 0 F RECORDER

Note : Set switches and MENU switches not listed above to the factory settings.

β-CAM SP | PVW-2650 + PVW-2800

— Connection example —



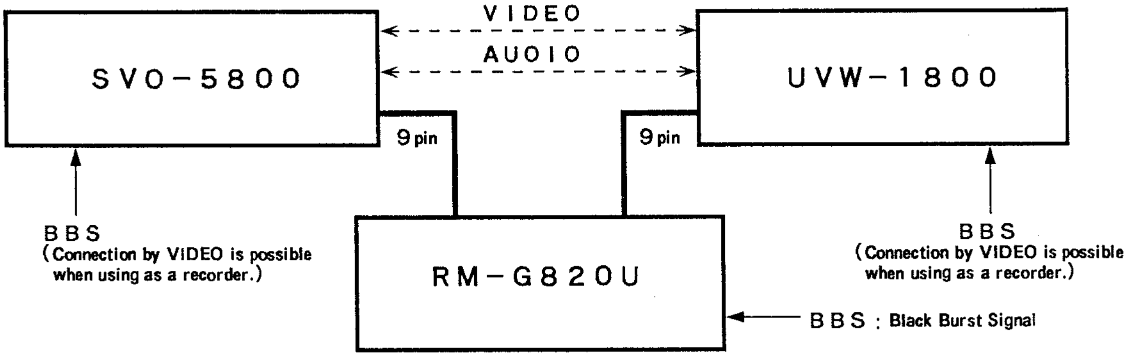
Note :
With this editing system, the program play function cannot be used.
So, set the RM-O820U TC mode to the "LTC" or "TC AUTO" mode.
If the TC mode is set to VITC, the interpolation mode cannot be applied to the VTR, so the counter may stop during search.
When executing slow motion editing, execute within the range ×(−1) to ×2 speed.
Also, set the preroll time during slow motion editing to 7second or more,
and setup MENU No.401 (FUNCTION MODE AFTER CUE-UP) TO "1". This improves editing accuracy.

Model	Part to be Operated	Selector Switch · Menu item	Setting
PVW-2650	Setup MENU	All items	Set before shipment from factory
	Front panel	REMOTE/LOCAL	REMOTE
PVW-2800	Setup MENU	All items	Set before shipment from factory
	Control panel	REMOTE/LOCAL	REMOTE
	Sub control panel	TC GENERATOR INT/EXT REGEN/PRESET REC RUN/FREE RUN	 INT PRESET FREE RUN
RM-G820U	MENU switch	MENU 01 PREROLL TIME EDIT TIMINNG MENU 02 SYNC GRADE MENU 18 BUMP SELECT	5 SEC. − 3 FRAME 0 F RECORDER

Note : Set switches and MENU switches not listed above to the fectory settings.

S-VHS & β-CAM SP	8VO−5800 (S-VHS) + UVW−1800 (β-CAM SP)

— Connection example —


VIDEO
AUOIO
SVO−5800
UVW−1800
9 pin
9 pin
BBS
(Connection by VIDEO is possible when using as a recorder.)
RM−G820U
BBS
(Connection by VIDEO is possible when using as a recorder.)
BBS : Black Burst Signal

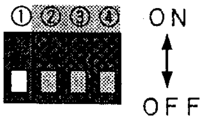
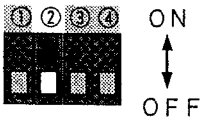
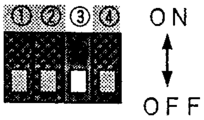
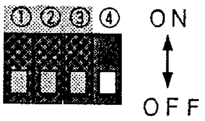
Note :
The VTR does not have a program play function. So, with this editing system, the program play function cannot be used.
The on-screen display of the SVO-5800 may differ with that of the RM-G820U counter.
So, match the timer mode of the SVO-5800 and RM-G820U counters.
The UVW-1800 is not provided with a VITC mode. So, set the RM-G820U TC mode to "LTC".
Also, an external synchronizing signal must be input to the UVW-1800. Otherwise, an error will be displayed.

Model	Part to be Operated	Selector Switch · Menu item	Setting
SVO−5800	Setup MENU	OPERATION PLAY／START TIME CODE RUN MODE VITC REC MODE INT TC MODE SERVO SYNC SELECT	5 FREE ON PRESET EXT
	Front panel	REMOTE／LOCAL TC INT／EXT	REMOTE INT
UVW−1800	Setup MENU	OPERATION AFTER CUE-UP PLAY／START TIME CODE RUN MODE	STILL 5 FREE
	Inside panel	REMOTE TC INT／EXT	REMOTE INT
RM−G820	MENU switch	MENU 01 PREROLL TIME EDIT TIMINNG MENU 02 SYNC GRADE MENU 18 BUMP SELECT	5 SEC. − 3 FRAME 0 F RECORDER

Note : Set switches and MENU switches not listed above to the factory settings.

1.4 INTERNAL SWITCHES

- [0] [1] MAIN CPU BOARD : Switch S1

	SWITCH NAME	FUNCTION
S1-1	GPI pulse selection  Factory setting : OFF	Selects the pulse of the GPI signal to be output from the GPI-4 output terminal. **OFF : Approx. 100msec** **ON : Approx. 300msec** **(The specifications of the unit to be connected prevent some functions from being accepted when the pulse width of the GPI signal is 100msec.)**
S1-2	LAST edit copy  Factory setting : OFF	Sets whether or not to copy editing data after editing ends to the next new event. **OFF : Do not copy to next new event after end of editing.** **ON : Copy to next new event after end of editing.**
S1-3	TC PRESET REC MODE  Factory setting : OFF	Selects whether or not to automatically set the VTR to the recording mode after presetting the time code. **OFF : Recording mode not entered.** **GN : Return 5seconds and set to "STOP" mode after recording for 15seconds.**
S1-4	TC AUTO ／ EDIT LAMP FLICKER  Factory setting : OFF	Automatically selects between reading of VITC or LTC depending on the VTR mode. Also, selects operation of the indicator when the edit mode select key is not selected. **OFF : Reads data according to the setting of the VITC／LTC／CTL select switch. Also, disables flickering of the indicator in the edit mode select key.** **ON : The timer mode is automatically switched to match the setting of the VTR when the VITC／LTC／CTL select switch is set to "VITC" or "LTC". Also, enables flickering of the indicator in the edit mode select key.**

- [0] [3] REAR-1 BOARD : DIP SW S1 (**Factory setting : "OFF"**)

	SWITCH NAME	FUNCTION
SW1-1	GPI manual take ／ Time Code UB preset	For details on each of the switch functions, see "3. Rear Panel DIP Switch Settings" on page44 of the Instruction Manual.
SW1-2	RTC mode	
SW1-3	Service switch	Allows you to check the functions of the switches and LEDs on the operation panel. For details, see "1. 5 ABOVE SERVICE MODE".
SW1-4	Open EDIT ALL STOP out entry	For details on each of the switch functions, see "3. Rear Panel DIP Switches Settings" on page45 of the Instruction Manual.
SW1-5	Review button function selection	
SW1-6	Not used	
SW1-7	Auto cleanup ／ Direct trim	
SW1-8	News edit switch	

1. 5 ABOUT SERVICE MODE

On the RM-G820U, a service mode is provided so that switches and buttons can be checked. In this way, the service mode allows you to check if the switches and buttons are working.

1) ROM version
2) Counter and LED operation (LED CHECK MODE)
3) Operation of operation buttons (CHECK 1)
4) Operation of 10key (SA-K80) buttons (CHECK 2)
5) Slide switch settings (CHECK 3)
6) Internal (DIP) switch settings (CHECK 4)
7) SEARCH／JOG dial functions (CHECK 5)
8) GPI and SYNC-IN terminal functions (CHECK 6)

For detail, see items 1. 5. 1 to 1. 5. 6

1. 5. 1 SERVICE MODE

Follow the procedure below to set the RM-G820U to the Service mode.

1) Make sure that the RM-G820U is "OFF"
2) Set DIP switch SW1-3 on the rear panel to "ON"
3) Turn the power "ON", and press the STOP button on the recorder while pressing the TOTAL button.
4) After about 3 seconds, the message shown in Fig. 1-5-1 appears on the display, indicating that the RM-G820U is in the service mode.

1. 5. 2 LED CHECK MODE

```
. . . . SERVICE  MODE. . . .

      ROM  VER.   X-X
   PUSH  TOTAL+R-STOP
```

X-X shows the ROM version No. (VX-X).
(MAIN CPU board : IC4)

Fig. 1-5-1 Service Mode Display

If you press the ALL STOP button while holding down the TOTAL and SHIFT operation buttons in the display in Fig. 1-5-1 above, the player and recorder counter displays will display the numbers "1, 2, 3, 4, 5, 6, 8" in that order, and finaly all LEDs on the operation panel will light.
This operation allows you to check whether or not the counter displays and LEDs are working properly.

```
. . . . SERVICE  MODE. . . .

     LED  CHECK  MODE
 (PUSH  ALLSTOP  SOON!)
```

Lighting all LEOs at once places a load on the fuses. Immediately after checking the functions, press the ALL STOP key to turn out the LEDs.

Fig. 1-5-2 Cheking Operation of Operation buttons

1. 5. 3 CHECK 1

CHECK 1 allows you to check operation of the operation buttons. If you press the STOP button on the recorder while holding down the TOTAL button in the display in Fig. 1-5-1, the controller display changes to that in Fig. 1-5-3 below.

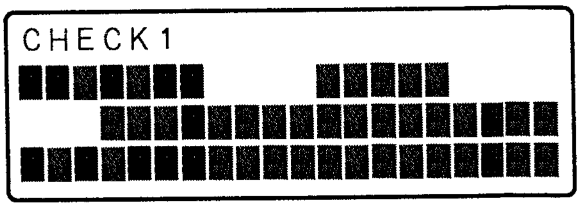
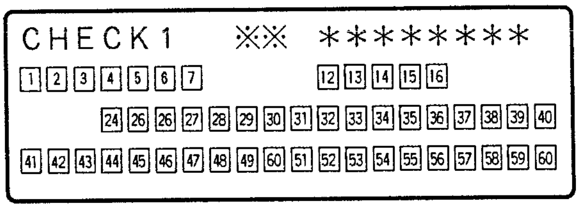


Fig. 1-5-3 Checking Operation of Operation Buttons

In this state, press the buttons on the operation panel. If the switch you have pressed is working, the corresponding LCD goes and the No. of the switch you pressed and the switch name is displayed to the right of CHECK 1. The switch No. is also displayed on the counter display on the player.
For details on the LCD positions for each of the switches and switch No. , see Fig. 1-5-4 and Table 1-5-1.



※※ shows the No. of the pressed switch.
******** shows the name of the pressed switch.

Fig. 1-5-4 LCD Positions and Switch No.

No.	NAME	No.	NAME	No.	NAME	No.	NAME
1	P-LAP	2	P-RESET	3	R-LAP	4	R-RESET
5	TOTAL	6	P-EJECT	7	P1	8	---
9	---	10	---	11	---	12	CONTINUE
13	START	14	END	15	V. SPEED	16	EVENT
17	---	18	---	19	---	20	---
21	---	22	---	23	---	24	R-EJECT
25	P-REC	26	P-REW	27	P-FF	28	P-STOP
29	ASSEM	30	VIDEO	31	AUD-1	32	AUD-2
33	TC	34	R-REC	35	R-REW	36	R-FF
37	R-STOP	38	P-PLAY	39	P-STILL	40	P-SEARCH
41	SPLIT	42	CANCEL	43	−	44	+
45	LAST ED	46	REC EE	47	R-PLAY	48	R-STILL
49	R-SEARCH	50	P-IN	51	P-OUT	52	ENTRY
53	R-IN	54	R-OUT	55	PREVIEW	56	AUTO EDIT
57	GO TO	58	REVIEW	59	SHIFT	60	ALL STOP

P : PLAYER
R : RECORDER

Table 1-5-1 Switch Name and No.

1. 5. 4 CHECK 2

CHECK2 allows you to check operation of the 10key.
If you press the STOP button on the recorder while holding down the TOTAL button in the CHECK 1 mode, the controller display changes to that in Fig. 1-5-5 below.

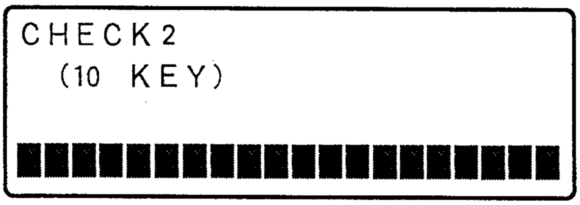
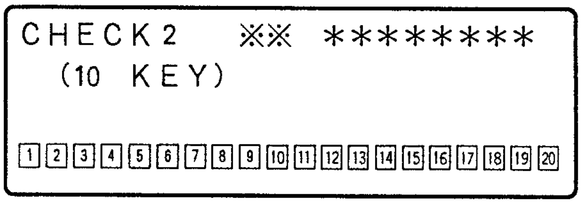


Fig. 1-5-5 Checking Operation of 10key (SA-K80U)

In the same way as for CHECK 1 , press the 10key buttons.
If the button you have pressed is working, the corresponding LCD goes out and the No. of the switch you pressed and the switch name isdisplayed to the right of CHECK 1. The switch No. is also displayed on the counter display on the player.
For details on the LCD positions for each of the switches and switch No. , see Fig. 1-5-6 and Table 1-5-2.



※※ shows the No. of the pressed switch.
******** shows the name of the pressed switch.

Fig. 1-5-6 LCD Positions and Switch No.

No.	NAME	No.	NAME	No.	NAME	No.	NAME
1	NUM LOCK	2	R	3	P1	4	P2
5	+	6	7	7	8	6	9
9	−	10	4	11	5	12	6
13	IN	14	1	16	2	16	3
17	OUT	18	0	10	C/00	20	ENTER

Table 1-5-2 Switch Name and No

Note : Press the NUM LOCK switch once to lock. When this check is finished, press the NUM LOCK switch again to unlock the switch.

1. 5. 5 CHECK 3

CHECK3 allows you to check the setting of the slide switches (BUMP, PREROLL, etc.).
If you press the STOP button on the recorder while holding down the TOTAL button in the CHECK 2 mode, the controller display changes to that in Fig. 1-5-7 below.

The slide switch settings in the following display are factory setting.

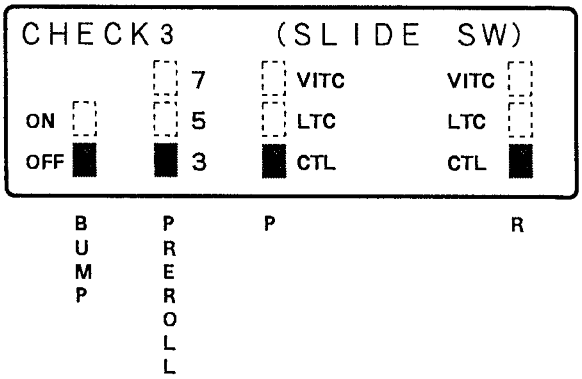


Fig. 1-5-7 Checking the Slide Switch Settings

The LCDs at this time indicate the current settings of the slide switches. For details on the relation between LCD positions and settings, see Fig. 1-5-7.
In this state, if you change the settings of the slide switches, the LCD positions also change.

1. 5. 6 CHECK 4

CHECK4 allows you to check the settings of the DIP switches on the MAIN CPU board and REAR-1 board.
If you press the STOP button on the recorder while holding down the TOTAL button in the CHECK 3 mode, the controller display changes to that in Fig. 1-5-8 below.

The DIP switch settings in the following display are factory setting.

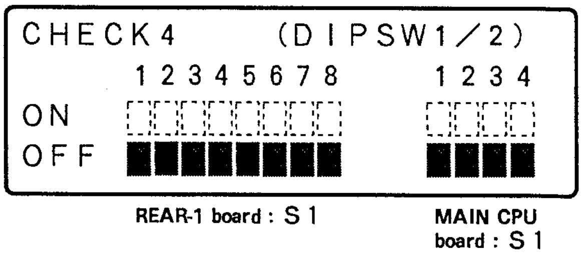
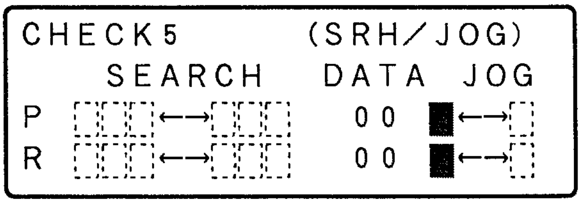


Fig. 1-5-8 Checking Internal (DIP) Switch Settings

Just as in CHECK 3, the LCD indicated positions and settings, see Fig. 1-5-8. Just as in CHECK 4, if you change the settings of the DIP switches in this state, the LCD positions also change.

1. 5. 7 CHECK 5

CHECK5 allows you to check the functions of the Search/Jog dials. If you press the STOP button on the recorder while holding down the TOTAL button in the CHECK 4 mode, the controller display changes to that in Fig. 1-5-9 below.



```
CHECK5        (SRH/JOG)
    SEARCH    DATA  JOG
P □□□←→□□□     00   ■←→□
R □□□←→□□□     00   ■←→□
```

Direction of advance of Search dial and data

Direction of advance of Jog dial

Fig. 1-5-9 Checking Search/Jog Dial Operation

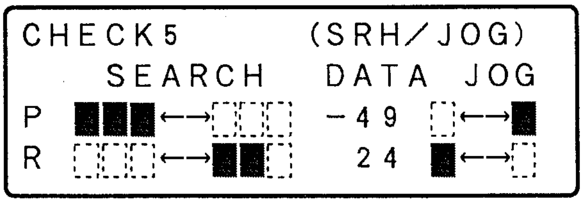
In this state, if you turn the Search dial in the FWD direction, DATA on the display changes within the range 1 to 49 (50). Likewise, if the search dial is turned in the REV direction, DATA changes within the range −1 to −49 (−50). During this operation, the number of SEARCH LEDs on the display changes together with the data that is displayed. (For details on LCD indications, see Table 1-5-3.)

"FWD" and "REV" are defined as follows. "FWD" is when the LCDs on the right of ↔ light as you face the panel, and "REV" is when the LCDs on the left of ↔ light.

The Jog dial does not display DATA such as indicated by Search, and indicates only the direction of rotation. When the Jog dial is moved in the FWD direction, one LCD on the right of ↔ light, and when the Jog dial is moved in the REV direction, one LCD on the left of ↔ lights.

If the data values do not change successively from −49 to +50, or the data display is abnormal, the Search/Jog control ass'y must be replaced.

P : PLAYER R : RECGRDER



```
CHECK5        (SRH/JOG)
    SEARCH    DATA  JOG
P ■■■←→□□□    −49   □←→■
R □□□←→■■□     24   ■←→□
```

SEARCH REV← →FWD

SPEED DATA (Search)

JGG REV←→FWD

In the figure avobe :
The Search dial is positioned near to REV MAX on the player and near the click point of ×1 speed in the FWD direction on the recorder.
It also shows the Jog dial rotating in the FWD direction on the player and in the REV direction on the recorder.

Fig 1-5-10 Display States

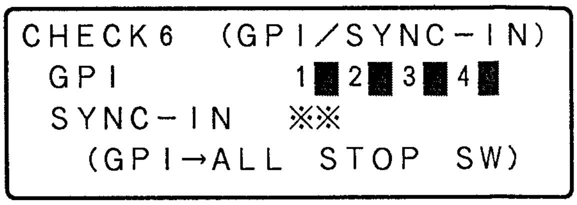
LCD indications	3		2		1	0	1	2		3	
DATA	−48 or more	←−46	−45←	−24 (23)	−23← (22)	0	→23 (22)	24 (23)	→45	46→	48 or more
Search Speed	REV MAX	←	←	REV ×1	←	0	→	FWD ×1	→	→	FWD MAX

Note : Max DATA may sbift by a single pulse due to the characteristic after tha power is turned "ON"

Table 1-5-3 LCD, DATA, Search Speed

1. 5. 6 CHECK 6

CHECK6 allows you to check GPI and SYNC-IN terminal functions. If you press the STOP button on the recoder while holding down the TOTAL button in the CHECK 5 mode, the controller display changes to that in Fig. 1-5-11 below.



```
CHECK6  (GPI/SYNC−IN)
 GPI         1■2■3■4■
 SYNC−IN   ※※
   (GPI→ALL  STOP  SW)
```

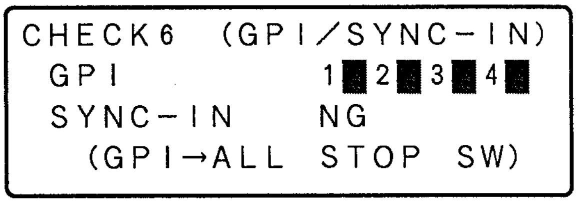
※※ :
"OK" is displayed when there is Sync input to the SYNC-IN terminal.
"NG" is displayed when there is no SYNC input.

Fig. 1-5-11 Checking GPI and SYNC-IN terminal Operation

If SYNC is being input to the SYNC-IN terminal, "OK" is displayed on the display. If SYNC is not being input, "NG" is displayed. In this way, input or non-input of the SYNC signal to the SYNC-IN terminal allows you to check the function of the SYNC-IN terminal.

If you press the ALL STOP key while Fig. 1-5-11 is displayed, the GPI signal is output from the GPI terminal. Output of the GPI signal at this time can be checked on the display, and the LCDs on the display are lit successively at the same time as output.

For details on output, see Fig. 1-5-12 and Table 1-5-4 below.



```
CHECK6  (GPI/SYNC−IN)
 GPI         1■2■3■4■
 SYNC−IN     NG
   (GPI→ALL  STOP  SW)
```

The LCDs in the display are lit successively in accordance with with Table 1-5-4 to indicate the GPI signal.
(1 : GPI1, 2 : GPI2, 3 : GPI3, 4 : GPI4)
In the above example, SYNC is not being input to the SYNC-IN terminal.

Fig. 1-5-12 Display States

Time after ALLSTOP button is pressed	GPI 1	GPI 2	GPI 3	GPI 4
Initial state	H	H	H	H
to 0. 5sec	L	L	L	L
to 1. 0sec	H	L	L	L
to 1. 5sec	H	H	L	L
to 2. 0sec	H	H	H	L
END	H	H	H	H

This operation is carried out twice.

H : LCD out
L : LCD lit

Table 1-5-4 GPI output Operation Table

Note : To exit the service mode, turn the power "OFF". And set OIP switcb SW1-3 to "OFF". Tben turn the power back "ON" again.

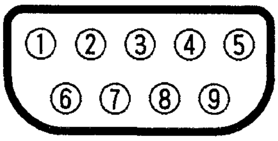
1. 6 PROTOCOL OF 9-PIN REMOTE CONNECTOR

In this section, the following is the contents of the remote control signal which is used for 9-pin connector of the RM-G820U.
In this protocol, it is defined that the CONTROLLER means the equipment which controls a VTR, and the DEVICE means the equipment which is controlled.

1. 6. 1 SPECIFICATION OF 9-PIN CONNECTOR

Interface connector : 9-pin D-sub female

Pin	CONTROLLER	DEVICE
1	Frame Ground	Frame Ground
2	Receive A	Transmit A
3	Transmit B	Receive B
4	Transmit Common	Receive Common
5	Spare	Spare
6	Receive Common	Transmit Common
7	Receive B	Transmit B
8	Transmit A	Receive A
9	Frame Ground	Frame Ground

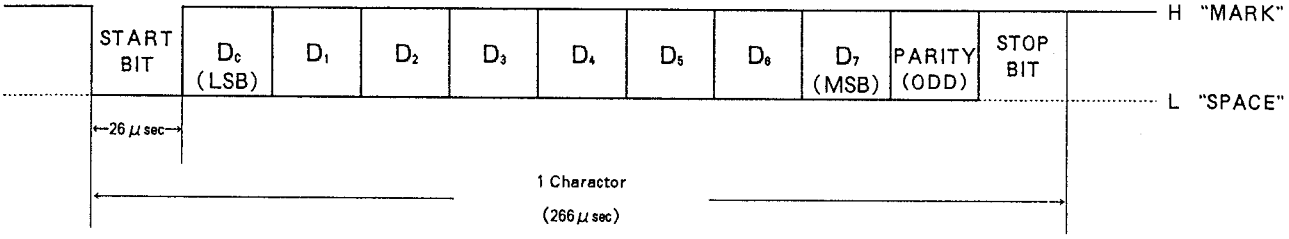


9 -pin CONNECTOR
(9 -pin cable side)

1. 6. 2 COMMUNICATION FORMAT

Format : EIA RS-422A
Mode : No synchronization
Character length : 11 bits ; 1 Start bit + 8 Data bits + 1 Parity bit + 1 Stop bit
Data rate : 38400 bps
Parity : Odd parity ; $D_0 + D_1 + \cdots + D_7 + P$ = An odd number
Start bit : 1bit L "SPACE"
Stop bit : 1bit H "MARK"

- The composition of bits.


START BIT
D0 (LSB)
D1
D2
D3
D4
D5
D6
D7 (MSB)
PARITY (ODD)
STOP BIT
H "MARK"
L "SPACE"
←26 μ sec→
1 Charactor (266 μ sec)

1. 6. 3 COMMAND FORMAT

All the data communications is composed of the CMD1/DATA COUNT, CMD2, DATA and CHECKSUM, and commands are transmitted in order from a LSB of the CMD1/DATA COUNT. When the DATA COUNT is zero, no data is transmitted, but when the DATA COUNT is not zero, a number of data which correspond with the value of DATA COUNT are inserted between the CMD2 and CHECKSUM.

1. COMMAND BLOCK FORMAT

The data communication between the CONTROLLER and the DEVICE is performed as follows.

2. CONTENTS OF COMMAND

CMD 1	DATA COUNT	CMD 2	DATA n (n=0~15)	CHECKSUM
MSD	LSD			
← 1 Byte →		← 1 Byte →	← n Byte →	← 1 Byte →

CMD 1 : Indicates the value according to the function and direction of the command.

DATA COUNT : Indicates the number of DATA bytes (0 to 15) where inserted between the CMD2 and CHECKSUM.

CMD1	FUNCTION	DIRECTION Controller Device
0	SYSTEM CONTROL	→
1	SYSTEM CONTROL RETURN	←
2	TRANSPORT CONTROL	→
4	PRESET & SELECT CONTROL	→
6	SENSE REQUEST	→
7	SENSE RETURN	←

CMD 2 : Designates the particular command.

DATA : When the data is added to the COMMAND which is defined by the CMD1 and CMD2, DATA-1 to DATA-15 shows the value corresponding to their contents.

CHECKSUM : This is used for checking up on the data communication error, adds from the first byte of the COMMAND block to the last DATA byte, and indicates the least significant 8 bits.

```
EX.  COMMAND  "61  4C  84"
  MSB              LSB
     0 1 1 0   0 0 0 1    (=6 1)
     0 1 0 0   1 1 0 0    (=4 C)
  +) 1 0 0 0   0 1 0 0    (=8 4)
  ---------------------
     0 0 1 1   0 0 0 1    (=3 1)
    CHECKSUM  "31"
```

1. 6. 4 COMMAND TABLE

CONTROLLER → DEVICE			DEVICE → CONTROLLER		
NAME	CMD 1	CMD 2	NAME	CMD 1	CMD 2
DEVICE TYPE REQUEST	00	11	DEVICE TYPE RETURN	12	11
STOP	20	00	ACK	10	01
PLAY	20	01	ACK	10	01
REC	20	02	ACK	10	01
STANDBY OFF	20	04	ACK	10	01
STANDBY ON	20	05	ACK	10	01
EJECT	20	0F	ACK	10	01
FAST FWD	20	10	ACK	10	01
JOG FWD	2X	11	ACK	10	01
VAR FWD	2X	12	ACK	10	01
SHUTTLE FWD	2X	13	ACK	10	01
REWIND	20	20	ACK	10	01
JOG REV	2X	21	ACK	10	01
VAR REV	2X	22	ACK	10	01
SHUTTLE REV	2X	23	ACK	10	01
CUE UP WITH DATA	24	31	ACK	10	01
PROGRAM PLAY +	21	38	ACK	10	01
PROGRAM PLAY −	21	39	ACK	10	01
FULL EE OFF	20	60	ACK	10	01
FULL EE ON	20	61	ACK	10	01
SELECTED EE ON	20	63	ACK	10	01
EDIT OFF	20	64	ACK	10	01
EDIT ON	20	65	ACK	10	01
TIME CODE PRESET	44	04	ACK	10	01
U-BIT PRESET	44	05	ACK	10	01
TIMER-1 RESET	40	08	ACK	10	01
EDIT PRESET	4X	30	ACK	10	01
TIMER MODE SELECT	41	36	ACK	10	01
CURRENT TIME SENSE	61	0C	TIMER-1 DATA	74	00
			TIMER-2 DATA	74	01
			LTC TIME DATA	74	04
			LTC UB DATA	74	05
			VITC TIME DATA	74	06
			VITC UB DATA	74	07
			LTC INTERPOLATED TIME DATA	74	14
			HOLD UB (LTC) DATA	74	15
			VITC HOLD TIME DATA	74	16
			HOLD UB (VITC) DATA	74	17
STATUS SENSE	61	20	STATUS DATA	7X	20

①COMMAND FROM CONTROLLER

- DEVICE TYPE REQUEST : 00.11
- DEVICE TYPE : 12.11

When the DEVICE receives the "DEVICE TYPE REQUEST : 00.11" command, the "DEVICE TYPE : 12.11" with 2 bytes data will be sent back to the CONTROLLER as a response.

MODEL	DATA-1	DATA-2
BR-S822U : SVHS-1	F 0	1 F
BR-S800U: SVHS-2	F 0	2 6

- ACK : 10.01

When receiving acknowledgment command, the DEVICE will send back this command.

- NAK : 11.12

When detecting the following errors, the DEVICE will send back this command as not-acknowledgment. Bit-7 to bit-0 of DATA-1 is set in accordance with the contents of the errors.

DATA-1

Bit-7	6	5	4	3	2	1	0
TIME OUT	FRAMING ERROR	OVERRUN ERROR	PARITY ERROR		CHECKSUM ERROR		UNDEFINED COMMAND

- STOP : 20.00
- PLAY : 20.01
- REC : 20.02
- EJECT : 20.0F
- STANDBY OFF : 20.04
- STANDBY ON : 20.05
- FAST FWD : 20.10
- REWIND : 20.20

These commands are used for setting of the DEVICE to the specified mode. The "STANDBY OFF : 20.04" command is available only in the STOP mode.

- JOG FWD : 2X.11
- VAR FWD : 2X.12
- SHUTTLE FWD : 2X.13
- JOG REV : 2X.21
- VAR REV : 2X.22
- SHUTTLE REV : 2X.23

When receiving one of the above commands, the DEVICE will start running in accordance with speed data. When only DATA-1 is given, the tape speed will be defined as follows.

$\text{TAPE SPEED} = 10^{(N/32-2)}$ N : SPEED DATA OF DATA-1 (DECIMAL)

When both DATA-1 and DATA-2 are given, the tape speed is more precise value than the tape speed defined by DATA-1, the tape speed will be defined as follows.

$\text{TAPE SPEED} = 10^{(N/32-2)} + N'/256\ \{10^{(N+1/32-2)} - 10^{(N-32-2)}\}$

N : SPEED DATA OF DATA-1
N ' : SPEED DATA OF DATA-2

- CUE UP WITH DATA : 24.31

This command is used for cueing up the DEVICE to the point defined by DATA-1 to DATA-4.

DATA-1		DATA-2		DATA-3		DATA-4	
10 Frame	1 Frame	10 Second	1 Second	10 Minute	1 Minute	10 Hour	1 Hour
MSD	LSD	MSD	LSD	MSD	LSD	MSD	LSD

Refer to ③TIME DATA FORMAT.

- PROGRAM PLAY + : 21.38
- PROGRAM PLAY − : 21.39

This commands are used for setting the DEVICE into the play back mode accordance with the DATA-1 as a speed data. At this time range of speed data is −20.0% to +20.0% by 0.1% step.

TAPE SPEED= (×1 PLAY SPEED) ×0.1×SPEED DATA (DECIMAL) SPEED DATA : 00H to FFH

- FULL EE OFF : 20.60
- FULL EE ON : 20.61

These commands are used for setting or clearing all channels to EE mode.

- SELECT EE ON : 20.63

This command is used for setting each EDIT PRESET channel assigned by the DATA-1 of the "EDIT PRESET : 41.30" command to the EE mode. To clear the EE mode, use the "EDIT OFF : 20.64" command.

- EDIT OFF : 20.64

This command is used for clearing the EDIT mode and also clearing the SELECT EE mode.

- EDIT ON : 20.66

This command is used for setting the DEVICE, which is running at the normal PLAY speed during the EDIT PRESET mode, to the EDIT mode.

- TIME CODE PRESET : 44.04

This command is used for presetting the value, which has been given by the DATA-1 to DATA-4, to the TIME CODE of the time code generator. As for the data format, refer to "CUE UP WITH DATA : 24.31" command. The mode of the NDF／DF is decided according to the bit-6 of DATA-1 as follows.

DATA-1 BIT-6	DF
0	OFF
1	ON

- U-BIT PRESET : 44.05

This command is used for presetting the value, which has been given by the DATA-1 to DATA-4 as follows, to the USER BIT of the time code generator.

DATA-1		DATA-2		DATA-3		DATA-4	
2nd BINARY GROUP	1st BINARY GROUP	4th BINARY GROUP	3rd BINARY GROUP	6th BINARY GROUP	5th BINARY GROUP	8th BINARY GROUP	7th BINARY GROUP
MSD	LSD	MSD	LSD	MSD	LSD	MSD	LSD

- TIMER-1 RESET : 40.08

This command is used for resetting the CTL COUNTER to zero.

- EDIT PRESET : 41.30

Each bit in the DATA-1 is defined as follows.

DATA-1

Bit-7	6	5	4	3	2	1	0
	INSERT	ASSEMBLE	VIDEO		TIME CODE	AUD-2	AUD-1

INSERT or ASSEMBLE mode is defined by the bit-6 and 5, and each channel is defined by Bit-4 to Bit-0.

- TIMER MODE SELECT : 41.36

This command is used for selecting the TIMER system by the state of the DATA-1 as follows.

DATA-1

00 : TIME CODE

01 : CTL COUNTER

FF : It depends on the setting of the DEVICE.

• CURRENT TIME SENSE : 61.0C

This command is used for requesting the TIME DATA or USER BIT, and the DEVICE will make a response according to the contents of DATA-1.

DATA-1

Bit-7	6	5	4	3	2	1	0
…	…	VITC UB	LTC UB	…	CTL COUNTER	VITC TIME	LTC TIME
M S D				L S D			

Request command DATA-1 Response command	01	02	03	04	10	20	30	11	22	33
74.00 : CTL COUNTER DATA				○						
74.04 : LTC TIME DATA	○		○							
74.14 : LTC INTERPOLATED TIME DATA	○		○							
74.05 : LTC U-BIT DATA					○		○			
78.04 : LTC TIME & U-BIT DATA								○		○
78.14 : LTC INTERPOLATED TIME & U-BIT DATA								○		○
74.06 : VITC TIME DATA		○	○							
74.16 : VITC INTERPOLATED TIME DATA		○	○							
74.07 : VITC U-BIT DATA						○	○			
78.06 : VITC TIME & U-BIT DATA									○	○
78.16 : VITC INTERPOLATED TIME & U-BIT DATA									○	○

• STATUS SENSE : 61.20

This command is used for requesting the status of the DEVICE, and the DEVICE will send back a response command "STATUS DATA : 7X.20" according to the contents of DATA-1 of the CONTROLLER.

MSD (Bit7~4) : Indicates the initial DATA No. of the "7X.20 : STATUS DATA" to be sent back.
LSD (Bit3~0) : Indicates the number of data bytes in "7X.20 : STATUS DATA" to be sent back.
EX. When the DATA-1 is "33".

The DEVICE will send back three bytes from the DATA No.3, i.e. DATA No.3 to DATA No.5 of the "7X.20 : STATUS DATA".

②RETURN FROM DEVICE

- LTC INTERPOLATED TIME DATA : 74.14

When the LTC TIME DATA of the DEVICE is requested, if the data of LTC played back by the DEVICE is corrected by the CTL either or it is read incorrectly, this command will be sent back to the CONTROLLER with the LTC TIME DATA. For the data format, refer to the "CUE UP WITH DATA : 24.31".

- TIMER-1 DATA : 74.00

This command is sent back to the CONTROLLER with the CTL COUNTER DATA. At this time, the BIT-6 of DATA-1 is set to "1" ("0") when the CTL COUNTER of the DEVICE is set to DF (NDF) mode. Fer the data format, refer to the "CUE UP WITH DATA : 24.31".

- LTC TIME DATA : 74.04

When the LTC TIME DATA of the DEVICE is requested, if the data of LTC is read correctly and this command is sent back to the CONTROLLER with four data. For the data format, refer to the "CUE UP WITH DATA : 24.31".

- LTC UB DATA : 74.05

This command is sent back to the CONTROLLER with the LTC UB DATA. For the data format, refer to the "U-BIT PRESET : 44.05".

- VITC TIME DATA : 74.06

This command is sent back to the CONTROLLER with the VITC TIME DATA. For the data format, refer to the "CUE UP WITH DATA : 24.31".

- VITC TIME DATA : 74.07

This command is sent back to the CONTROLLER with the VITC UB DATA. For the data format, refer to the "U-BIT PRESET : 44.05".

- VITC HOLD TIME DATA : 74.16

When the VITC TIME DATA of the DEVICE is requested if it will be read incorrectly, this command will be sent back to the CONTROLLER with the VITC TIME DATA. For the data format, refer to the "CUE UP WITH DATA : 24.31".

③FORMAT OF TIME DATA

The format of the TIME DATA is used by the "CUE UP DATA : 24.31" command etc. show as follows.

	MSB							LSB
DATA-1	CF	DF	← 10F →		← 1F →			
DATA-2	▨	← 10S →			← 1S →			
DATA-3	▨	← 10M →			← 1M →			
DATA-4	▨	▨	← 10H →		← 1H →			

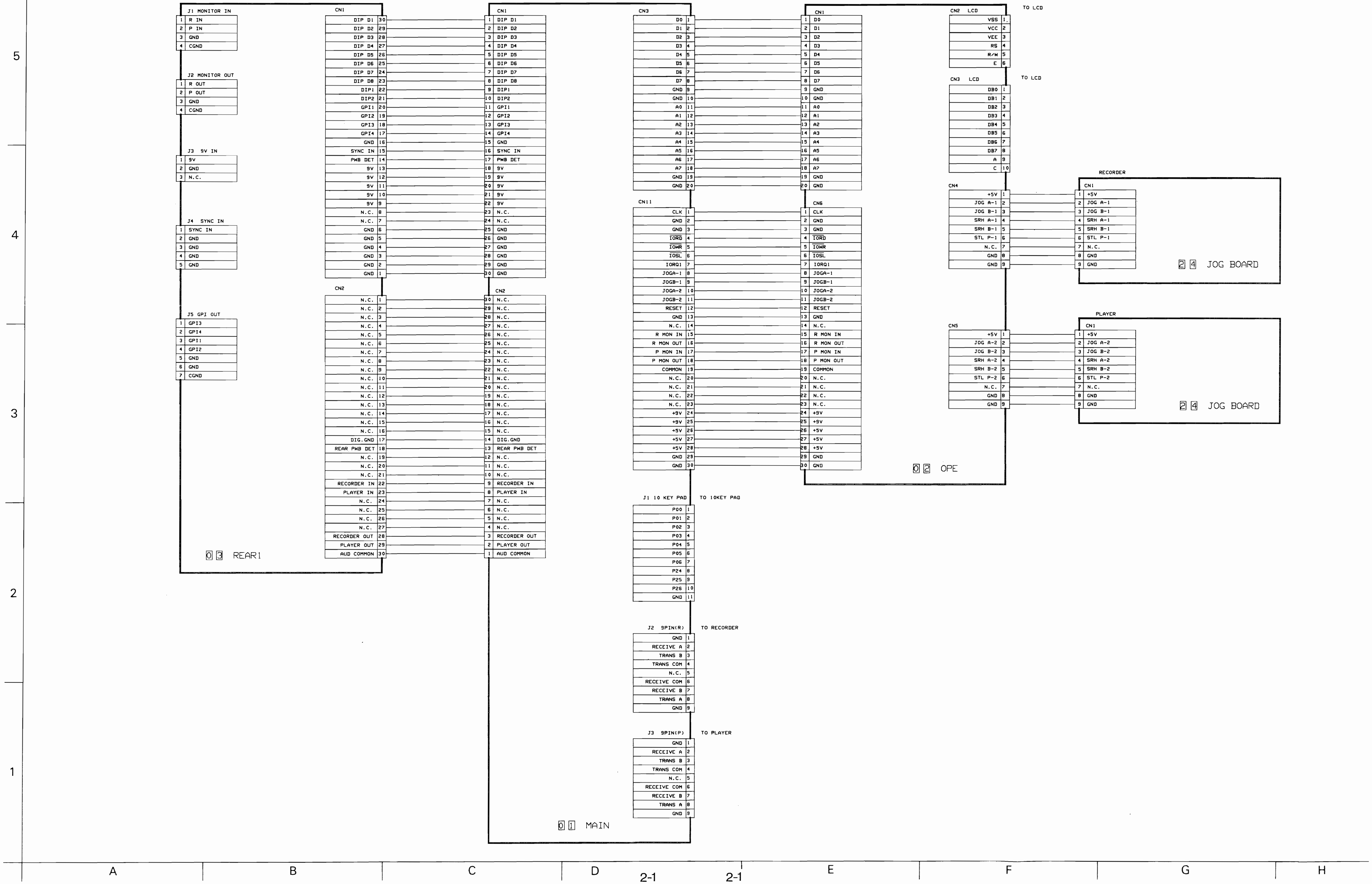
1. DATA-1/BIT-7 : CF FLAG ("1"CF ON, "0"CF OFF)

When the DEVICE receives the "CURRENT TIME SENSE : 61.0C" command, if the DEVICE has been set to the CF mode and it will be set to "1".

2. The BIT of ▨ mark has no meaning as a TIME DATA.

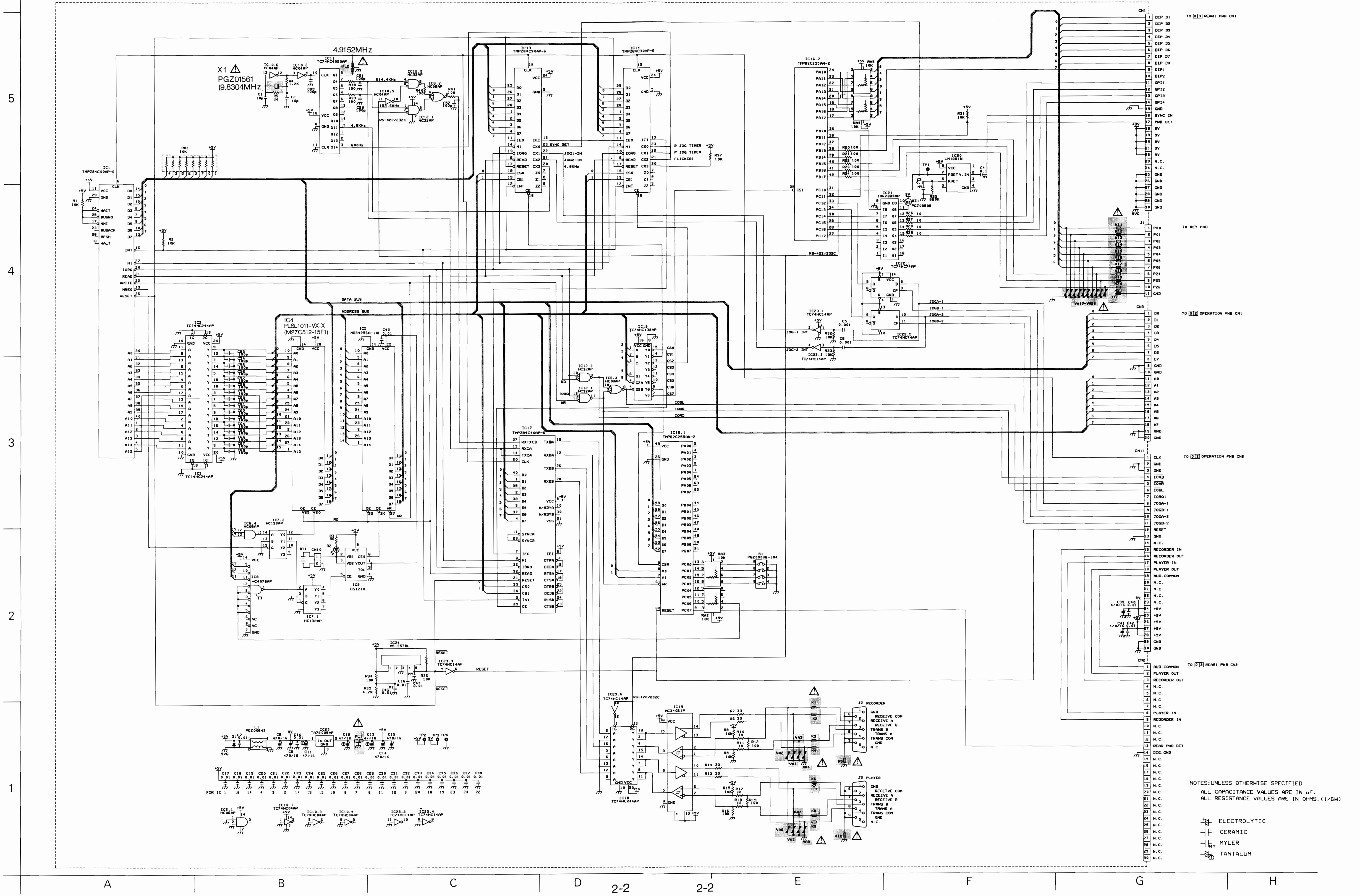
SECTION 2
DIAGRAMS AND CIRCUIT BOARDS

2.1 OVERALL WIRING DIAGRAM



6
5
4
3
2
1
A
B
C
D
E
F
G
H
03 REAR1
J1 MONITOR IN
1 R IN
2 P IN
3 GND
4 CGND
J2 MONITOR OUT
1 R OUT
2 P OUT
3 GND
4 CGND
J3 9V IN
1 9V
2 GND
3 N.C.
J4 SYNC IN
1 SYNC IN
2 GND
3 GND
4 GND
5 GND
J5 GPI OUT
1 GPI3
2 GPI4
3 GPI1
4 GPI2
5 GND
6 GND
7 CGND
CN1
DIP D1 30
DIP D2 29
DIP D3 28
DIP D4 27
DIP D5 26
DIP D6 25
DIP D7 24
DIP D8 23
DIP1 22
DIP2 21
GPI1 20
GPI2 19
GPI3 18
GPI4 17
GND 16
SYNC IN 15
PWB DET 14
9V 13
9V 12
9V 11
9V 10
9V 9
N.C. 8
N.C. 7
GND 6
GND 5
GND 4
GND 3
GND 2
GND 1
CN2
N.C. 1
N.C. 2
N.C. 3
N.C. 4
N.C. 5
N.C. 6
N.C. 7
N.C. 8
N.C. 9
N.C. 10
N.C. 11
N.C. 12
N.C. 13
N.C. 14
N.C. 15
N.C. 16
DIG.GND 17
REAR PWB DET 18
N.C. 19
N.C. 20
N.C. 21
RECORDER IN 22
PLAYER IN 23
N.C. 24
N.C. 25
N.C. 26
N.C. 27
RECORDER OUT 28
PLAYER OUT 29
AUD COMMON 30
01 MAIN
CN1
1 DIP D1
2 DIP D2
3 DIP D3
4 DIP D4
5 DIP D5
6 DIP D6
7 DIP D7
8 DIP D8
9 DIP1
10 DIP2
11 GPI1
12 GPI2
13 GPI3
14 GPI4
15 GND
16 SYNC IN
17 PWB DET
18 9V
19 9V
20 9V
21 9V
22 9V
23 N.C.
24 N.C.
25 GND
26 GND
27 GND
28 GND
29 GND
30 GND
CN2
30 N.C.
29 N.C.
28 N.C.
27 N.C.
26 N.C.
25 N.C.
24 N.C.
23 N.C.
22 N.C.
21 N.C.
20 N.C.
19 N.C.
18 N.C.
17 N.C.
16 N.C.
15 N.C.
14 DIG.GND
13 REAR PWB DET
12 N.C.
11 N.C.
10 N.C.
9 RECORDER IN
8 PLAYER IN
7 N.C.
6 N.C.
5 N.C.
4 N.C.
3 RECORDER OUT
2 PLAYER OUT
1 AUD COMMON
CN3
D0 1
D1 2
D2 3
D3 4
D4 5
D5 6
D6 7
D7 8
GND 9
GND 10
A0 11
A1 12
A2 13
A3 14
A4 15
A5 16
A6 17
A7 18
GND 19
GND 20
CN11
CLK 1
GND 2
GND 3
IORD 4
IOWR 5
IOSL 6
IORQ1 7
JOGA-1 8
JOGB-1 9
JOGA-2 10
JOGB-2 11
RESET 12
GND 13
N.C. 14
R MON IN 15
R MON OUT 16
P MON IN 17
P MON OUT 18
COMMON 19
N.C. 20
N.C. 21
N.C. 22
N.C. 23
+9V 24
+9V 25
+5V 26
+5V 27
+5V 28
GND 29
GND 30
J1 10 KEY PAD
TO 10KEY PAD
P00 1
P01 2
P02 3
P03 4
P04 5
P05 6
P06 7
P24 8
P25 9
P26 10
GND 11
J2 9PIN(R)
TO RECORDER
GND 1
RECEIVE A 2
TRANS B 3
TRANS COM 4
N.C. 5
RECEIVE COM 6
RECEIVE B 7
TRANS A 8
GND 9
J3 9PIN(P)
TO PLAYER
GND 1
RECEIVE A 2
TRANS B 3
TRANS COM 4
N.C. 5
RECEIVE COM 6
RECEIVE B 7
TRANS A 8
GND 9
02 OPE
CN1
1 D0
2 D1
3 D2
4 D3
5 D4
6 D5
7 D6
8 D7
9 GND
10 GND
11 A0
12 A1
13 A2
14 A3
15 A4
16 A5
17 A6
18 A7
19 GND
20 GND
CN6
1 CLK
2 GND
3 GND
4 IORD
5 IOWR
6 IOSL
7 IORQ1
8 JOGA-1
9 JOGB-1
10 JOGA-2
11 JOGB-2
12 RESET
13 GND
14 N.C.
15 R MON IN
16 R MON OUT
17 P MON IN
18 P MON OUT
19 COMMON
20 N.C.
21 N.C.
22 N.C.
23 N.C.
24 +9V
25 +9V
26 +5V
27 +5V
28 +5V
29 GND
30 GND
CN2 LCD
TO LCD
VSS 1
VCC 2
VEE 3
RS 4
R/W 5
E 6
CN3 LCD
TO LCD
DB0 1
DB1 2
DB2 3
DB3 4
DB4 5
DB5 6
DB6 7
DB7 8
A 9
C 10
CN4
+5V 1
JOG A-1 2
JOG B-1 3
SRH A-1 4
SRH B-1 5
STL P-1 6
N.C. 7
GND 8
GND 9
CN5
+5V 1
JOG A-2 2
JOG B-2 3
SRH A-2 4
SRH B-2 5
STL P-2 6
N.C. 7
GND 8
GND 9
RECORDER
24 JOG BOARD
CN1
1 +5V
2 JOG A-1
3 JOG B-1
4 SRH A-1
5 SRH B-1
6 STL P-1
7 N.C.
8 GND
9 GND
PLAYER
24 JOG BOARD
CN1
1 +5V
2 JOG A-2
3 JOG B-2
4 SRH A-2
5 SRH B-2
6 STL P-2
7 N.C.
8 GND
9 GND

2.2 MAIN CPU SCHEMATIC DIAGRAM



IC1 TMPZ84C00AP-6
IC2 TC74HC244AP
IC3 TC74HC244AP
IC4 PLSL1011-VX-X (M27C512-15F1)
IC5 MB8425GA-10L
IC6.4 HC08AP
IC7.2 HC139AP
IC7.1 HC139AP
IC8 HC4079AP
IC9 DS1210
IC11 TC74HC4020AP
IC13 TMPZ84C30AP-6
IC14 TMPZ84C30AP-6
IC15 TC74HC138AP
IC16.1 TMP82C255AN-2
IC16.2 TMP82C255AN-2
IC17 TMPZ84C40AP-8
IC18 TC74HC244AP
IC19 MC3405IP
IC20 LM1881N
IC21 TD62083AP
IC22.1 TC74HC74AP
IC22.2 TC74HC74AP
IC23.1 TC74HC14AP
IC23.2 TC74HC14AP
IC23.3 TC74HC14AP
IC23.6 TC74HC14AP
IC24 M51957BL
IC25 TA78005AP
X1 PGZ01561 (9.8304MHz)
4.9152MHz
614.4KHz
153.6KHz
4.8KHz
600Hz
RS-422/232C
SYNC DET
JOG1-IN
JOG2-IN
R JOG TIMER
P JOG TIMER
FLICKER1
DATA BUS
ADDRESS BUS
RESET
RD
WR
IORQ
IOSL
IOWR
IORD
BT1
CN10
S1 PGZ00096-104
J1
J2 RECORDER
J3 PLAYER
CN1
CN2
CN3
CN11
TO [G]2 REAR1 PWB CN1
10 KEY PAD
TO [G]2 OPERATION PWB CN1
TO [G]2 OPERATION PWB CN6
TO [G]3 REAR1 PWB CN2
DIP D1
DIP D2
DIP D3
DIP D4
DIP D5
DIP D6
DIP D7
DIP D8
SYNC IN
PWB DET
RECORDER IN
RECORDER OUT
PLAYER IN
PLAYER OUT
AUD.COMMON
REAR PWB DET
DIG.GND
VA17-VA28
FOR IC 1 16 14 4 3 2 17 13 15 10 8 7 6 11 12 9 20 18 19 23 24 22
A B C D E F G H
1 2 3 4 5 6

NOTES:UNLESS OTHERWISE SPECIFIED
ALL CAPACITANCE VALUES ARE IN uF.
ALL RESISTANCE VALUES ARE IN OHMS.(1/6W)

ELECTROLYTIC
CERAMIC
MYLER
TANTALUM

–DC voltage:MAIN CPU (1/2) –

Voltage measurement conditions : The following values are measured with a digital volt meter device in the situation of being not connected to the connector of 9 pin, each of I/O devices and exception of the power supply terminal.

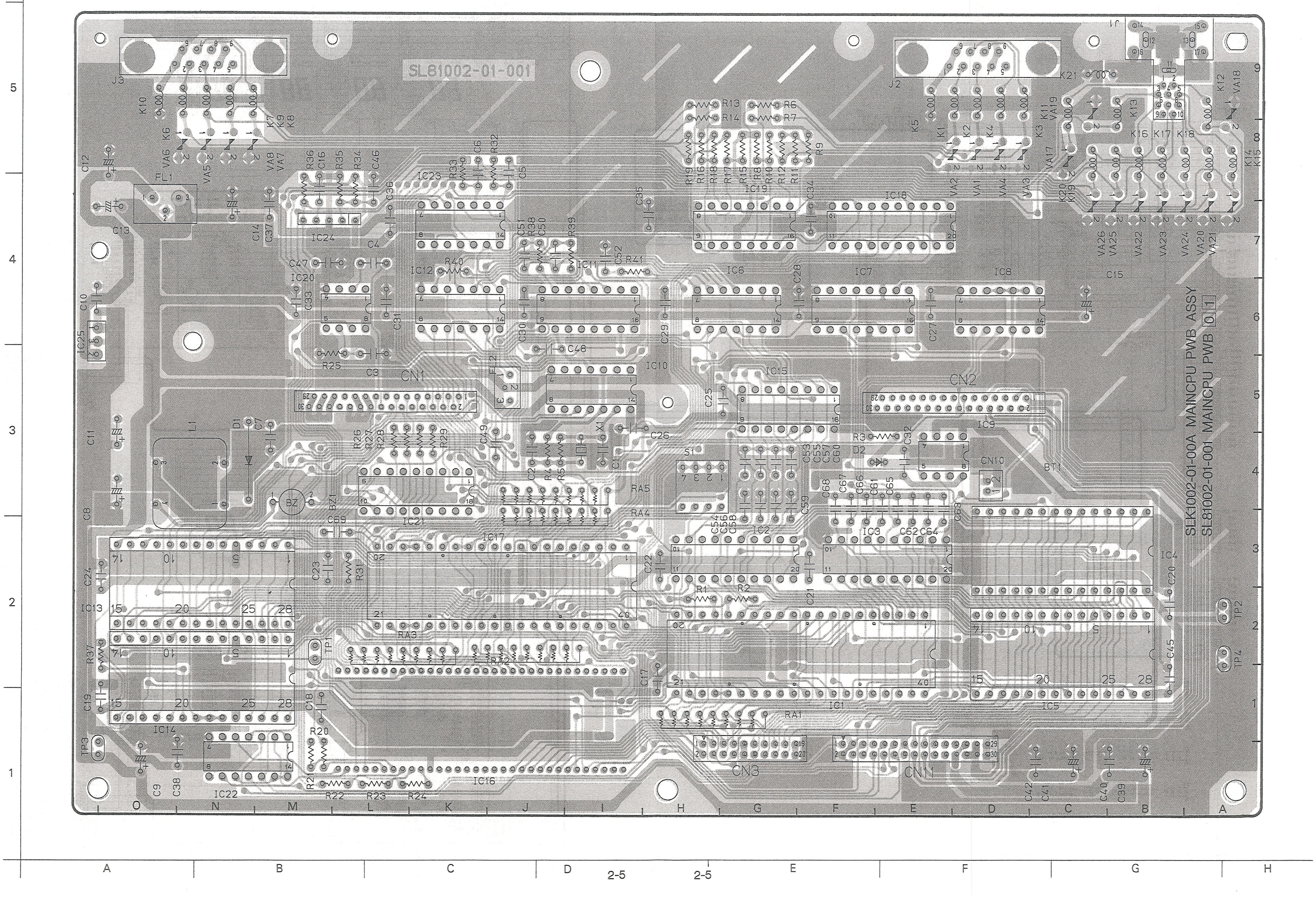
SYMBOL	No.	VOLTAGE
I		C
IC 1	1	0.0
	2	3.0
	3	2.4
	4	2.1
	5	1.7
	6	2.4
	7	2.4
	8	2.6
	9	2.6
	10	3.0
	11	5.0
	12	2.2
	13	2.6
	14	2.9
	15	2.4
	16	5.0
	17	5.0
	18	5.0
	19	2.0
	20	5.0
	21	2.8
	22	4.9
	23	5.0
	24	5.0
	25	5.0
	26	5.0
	27	3.9
	28	3.9
	29	0.0
	30	2.4
	31	2.4
	32	2.4
	33	2.6
	34	2.7
	35	2.9
	36	0.8
	37	3.2
	38	1.9
	39	0.0
	40	0.0
IC 2	1	0.0
	2	0.8
	3	3.2
	4	4.1
	5	4.1
	6	2.2
	7	2.4
	8	—
	9	—
	10	0.0
	11	2.4
	12	2.4
	13	2.4
	14	2.4
	15	2.5
	16	2.6
	17	1.8
	18	2.3
	19	0.0
	20	5.0
IC 3	1	0.0
	2	2.3
	3	1.6
	4	0.0
	5	5.0
	6	0.0
	7	0.0
	8	2.4
	9	0.0
	10	0.0
	11	0.0
IC 3	12	2.5
	13	0.0
	14	0.0
	15	5.0
	16	0.0
	17	2.4
	18	2.5
	19	0.0
	20	5.0
IC 4	1	2.5
	2	0.0
	3	0.0
	4	3.7
	5	3.7
	6	1.2
	7	3.7
	8	1.2
	9	1.2
	10	3.7
	11	5.1
	12	0.5
	13	5.1
	14	0.0
	15	0.6
	16	0.6
	17	0.7
	18	0.6
	19	0.2
	20	1.9
	21	2.5
	22	3.1
	23	0.0
	24	2.5
	25	5.0
	26	2.5
	27	0.0
	28	5.0
IC 5	1	0.0
	2	0.0
	3	0.0
	4	3.7
	5	3.7
	6	1.2
	7	3.7
	8	1.2
	9	1.2
	10	3.7
	11	5.1
	12	0.5
	13	5.1
	14	0.0
	15	0.6
	16	0.6
	17	0.6
	18	0.6
	19	0.2
	20	5.0
	21	2.5
	22	3.1
	23	0.0
	24	2.5
	25	5.0
	26	2.5
	27	5.0
	28	5.0
IC 6	1	0.0
	2	0.0
	3	0.0
	4	2.5
	5	5.0
	6	2.5
	7	0.0
IC 6	8	5.0
	9	5.0
	10	5.0
	11	0.0
	12	2.5
	13	0.0
	14	5.0
IC 7	1	5.0
	2	5.0
	3	0.0
	4	5.0
	5	5.0
	6	5.0
	7	5.0
	8	0.0
	9	5.0
	10	5.0
	11	5.0
	12	1.9
	13	0.0
	14	0.0
	15	1.9
	16	5.0
IC 8	1	5.0
	2	5.0
	3	5.0
	4	5.0
	5	5.0
	6	—
	7	0.0
	8	—
	9	2.5
	10	0.0
	11	0.0
	12	5.0
	13	0.0
	14	5.0
IC 9	1	5.0
	2	3.8
	3	5.0
	4	0.0
	5	5.0
	6	5.0
	7	3.6
	8	5.0
IC10	1	0.0
	2	5.0
	3	2.5
	4	2.5
	5	0.0
	6	5.0
	7	0.0
	8	5.0
	9	0.0
	10	0.0
	11	5.0
	12	2.5
	13	2.4
	14	5.0
IC11	1	2.5
	2	2.5
	3	2.5
	4	2.5
	5	2.5
	6	2.5
	7	2.5
	8	0.0
	9	2.4
	10	2.5
	11	0.0
IC11	12	2.5
	13	2.5
	14	2.5
	15	2.5
	16	5.0
IC12	1	2.5
	2	5.0
	3	5.0
	4	2.5
	5	0.0
	6	2.5
	7	0.0
	8	5.0
	9	3.1
	10	5.0
	11	5.0
	12	5.0
	13	5.0
	14	5.0
IC13	1	0.6
	2	0.6
	3	0.6
	4	0.2
	5	0.0
	6	3.1
	7	0.0
	8	0.0
	9	0.0
	10	5.0
	11	0.0
	12	0.0
	13	0.0
	14	2.4
	15	2.4
	16	5.0
	17	5.0
	18	3.7
	19	1.2
	20	2.5
	21	5.0
	22	5.0
	23	0.0
	24	5.0
	25	5.1
	26	0.5
	27	5.1
	28	0.6
IC14	1	0.6
	2	0.7
	3	0.6
	4	0.2
	5	0.0
	6	3.1
	7	0.0
	8	0.0
	9	0.0
	10	5.0
	11	0.0
	12	0.0
	13	5.0
	14	2.4
	15	2.4
	16	5.0
	17	5.0
	18	3.7
	19	1.2
	20	5.0
	21	2.5
	22	2.5
	23	2.5
	24	5.0
	25	5.1
IC14	26	0.5
	27	5.1
	28	0.6
IC15	1	1.2
	2	3.7
	3	1.2
	4	3.7
	5	5.0
	6	3.7
	7	5.0
	8	0.0
	9	5.0
	10	5.0
	11	5.0
	12	5.0
	13	5.0
	14	5.0
	15	5.0
	16	5.0
IC16	1	0.0
	2	0.0
	3	0.0
	4	0.0
	5	0.0
	6	5.0
	7	1.2
	8	3.7
	9	0.0
	10	4.9
	11	4.9
	12	4.9
	13	4.9
	14	4.9
	15	4.9
	16	4.9
	17	4.9
	18	4.9
	19	5.0
	20	4.9
	21	4.9
	22	5.0
	23	5.0
	24	5.0
	25	5.0
	26	0.0
	27	0.0
	28	0.0
	29	0.0
	30	0.0
	31	0.0
	32	0.0
	33	5.0
	34	5.0
	35	0.0
	36	5.0
	37	0.0
	38	5.0
	39	0.0
	40	5.0
	41	5.0
	42	5.0
	43	5.0
	44	0.0
	45	0.0
	46	0.0
	47	0.0
	48	0.0
	49	0.0
	50	0.0
	51	0.0
	52	0.2
	53	0.6
	54	0.6

–DC voltage:MAIN CPU (2/2) –

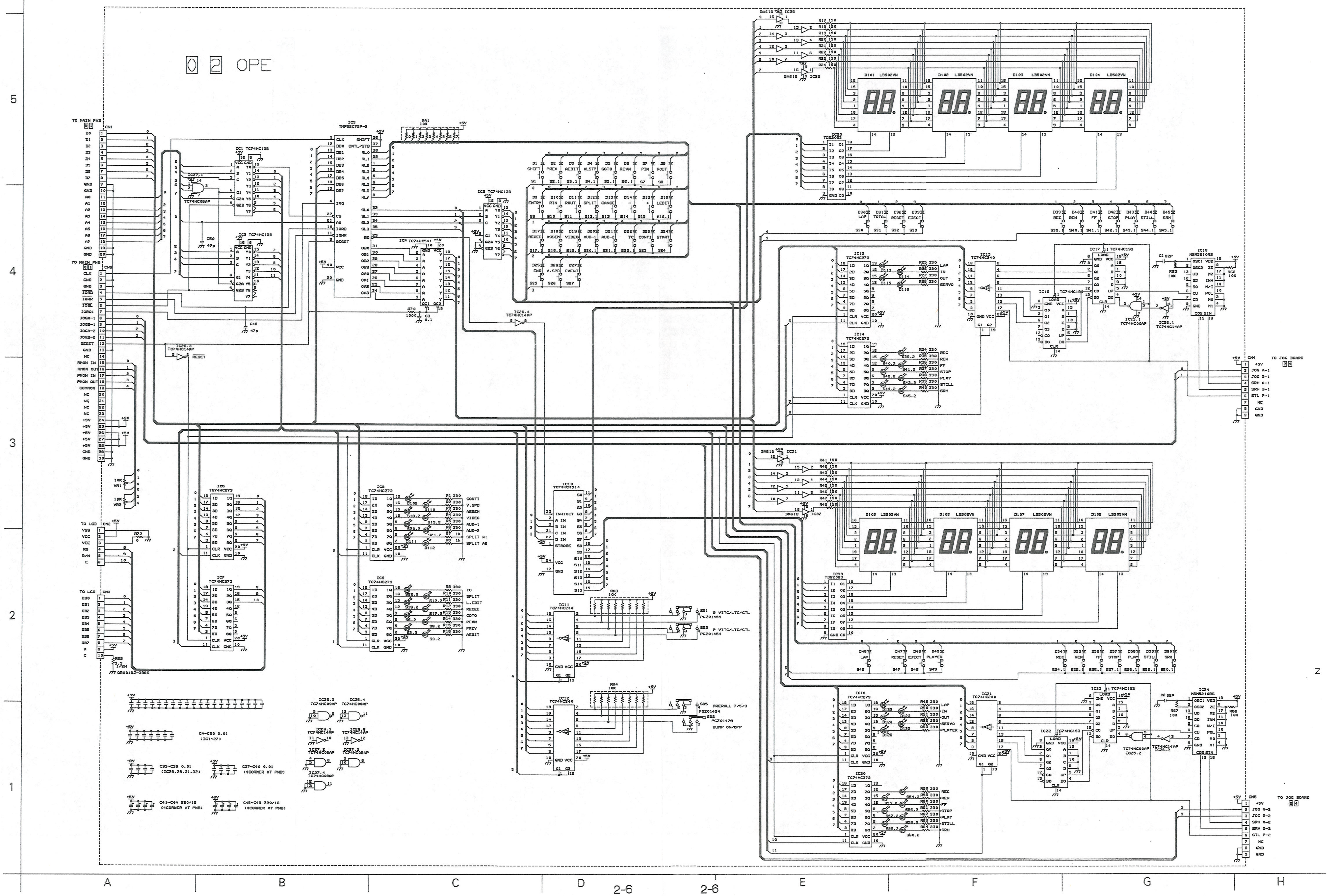
Voltage measurement conditions : The following values are measured with a digital volt meter device in the situation of being not connected to the connector of 9 pin, each of I/O devices and exception of the power supply terminal.

SYMBOL	No.	VOLTAGE
IC16	55	0.6
	56	0.6
	57	5.1
	58	0.5
	59	5.1
	60	0.0
	61	5.0
	62	—
	63	—
	64	—
IC17	1	0.5
	2	0.6
	3	0.7
	4	0.2
	5	0.0
	6	5.0
	7	5.0
	8	2.4
	9	5.0
	10	—
	11	4.9
	12	0.0
	13	2.5
	14	2.5
	15	5.0
	16	0.0
	17	0.0
	18	0.0
	19	0.0
	20	2.4
	21	4.9
	22	0.0
	23	0.0
	24	0.0
	25	0.0
	26	5.0
	27	2.5
	28	0.0
	29	4.7
	30	—
	31	0.0
	32	3.1
	33	3.4
	34	1.2
	35	5.0
	36	5.0
	37	0.6
	38	0.6
	39	5.1
	40	5.1
IC18	1	0.0
	2	4.8
	3	4.8
	4	0.1
	5	—
	6	4.9
	7	4.9
	8	0.1
	9	—
	10	0.0
	11	0.1
	12	0.0
	13	0.0
	14	4.9
	15	0.1
	16	0.0
	17	0.0
	18	4.8
	19	5.0
	20	5.0
IC19	1	2.7
	2	2.3
	3	0.1
	4	5.0
	5	0.1
	6	2.3
	7	2.7
	8	0.0
	9	—
	10	3.6
	11	0.2
	12	5.0
	13	0.3
	14	3.5
	15	4.8
	16	5.0
IC20	1	0.0
	2	1.5
	3	0.0
	4	0.0
	5	5.0
	6	1.2
	7	0.0
	8	5.0
IC21	1	0.0
	2	0.0
	3	0.0
	4	0.0
	5	0.0
	6	0.0
	7	0.0
	8	0.0
	9	0.0
	10	7.8
	11	8.3
	12	0.6
	13	0.0
	14	0.6
	15	0.6
	16	0.6
	17	0.6
	18	0.6
IC22	1	5.0
	2	0.0
	3	4.9
	4	5.0
	5	5.0
	6	0.0
	7	0.0
	8	0.0
	9	5.0
	10	5.0
	11	0.0
	12	4.9
	13	5.0
	14	5.0
IC23	1	0.0
	2	5.0
	3	0.0
	4	5.0
	5	5.0
	6	0.0
	7	0.0
	8	5.0
	9	0.0
	10	5.0
	11	0.0
	12	0.0
	13	5.0
	14	5.0
IC24	1	5.0
	2	1.6
	3	0.0
	4	1.2
	5	5.0
IC25	1	8.7
	2	5.0
	3	0.0
CONNECTOR		
CN 1	1	5.0
	2	5.0
	3	5.0
	4	5.0
	5	5.0
	6	5.0
	7	5.0
	8	5.0
	9	0.8
	10	—
	11	—
	12	—
	13	—
	14	—
	15	0.0
	16	0.0
	17	0.0
	18	8.8
	19	8.8
	20	8.8
	21	8.8
	22	8.8
	23	—
	24	—
	25	0.0
	26	0.0
	27	0.0
	28	0.0
	29	0.0
	30	0.0
CN 2	1	0.0
	2	0.0
	3	0.0
	4	—
	5	—
	6	—
	7	—
	8	0.0
	9	0.0
	10	—
	11	—
	12	—
	13	0.0
	14	0.0
	15	—
	16	—
	17	—
	18	—
	19	—
	20	—
	21	—
	22	—
	23	—
	24	—
	25	—
	26	—
	27	—
	28	—
	29	—
	30	—
CN 3	1	0.8
	2	0.8
	3	0.8
	4	0.8
	5	0.8
	6	0.8
	7	2.5
	8	2.2
	9	0.0
	10	0.0
	11	2.4
CN 3	12	2.4
	13	2.4
	14	2.1
	15	1.2
	16	2.0
	17	2.2
	18	2.1
	19	0.0
	20	0.0
CN10	1	3.5
	2	0.0
CN11	1	2.4
	2	0.0
	3	0.0
	4	5.0
	5	4.9
	6	4.9
	7	0.0
	8	0.0
	9	0.0
	10	4.9
	11	0.0
	12	0.0
	13	0.0
	14	—
	15	0.0
	16	0.0
	17	0.0
	18	0.0
	19	0.0
	20	—
	21	—
	22	—
	23	—
	24	8.7
	25	8.7
	26	4.9
	27	4.9
	28	4.9
	29	0.0
	30	0.0

2.3 MAIN CPU CIRCUIT BOARD


SL81002-01-001
SLK1002-01-00A MAINCPU PWB ASSY
SL81002-01-001 MAINCPU PWB 01
J1
J2
J3
CN1
CN2
CN3
CN10
CN11
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC14
IC15
IC16
IC17
IC18
IC19
IC20
IC21
IC22
IC23
IC24
IC25
FL1
FL2
L1
D1
D2
X1
S1
BZ
BZ1
BT1
RA1
RA2
RA3
RA4
RA5
TP1
TP2
TP3
TP4
A
B
C
D
E
F
G
H
1
2
3
4
5
6

2.4 OPERATION SCHEMATIC DIAGRAM



0 2 OPE
TO MAIN PWB
CN1
CN6
IC1 TC74HC138
IC2 TC74HC138
IC3 TMP82C79P-2
IC4 TC74HC541
IC5 TC74HC138
IC6 TC74HC273
IC7 TC74HC273
IC8 TC74HC273
IC9 TC74HC273
IC10 TC74HC4514
IC11 TC74HC240
IC12 TC74HC240
IC13 TC74HC273
IC14 TC74HC273
IC15 TC74HC240
IC16 TC74HC193
IC17 TC74HC193
IC18 MSM5218RS
IC19 TC74HC273
IC20 TC74HC273
IC21 TC74HC240
IC22 TC74HC193
IC23 TC74HC193
IC24 MSM5218RS
IC30 TD62083
IC33 TD62083
D101 LB502VN
D102 LB502VN
D103 LB502VN
D104 LB502VN
D105 LB502VN
D106 LB502VN
D107 LB502VN
D108 LB502VN
RA1 10K
RA3 10K
RA4 10K
SHIFT
PREV
AEDIT
ALSTP
GOTO
REVW
PIN
POUT
ENTRY
RIN
ROUT
SPLIT
CANCE
LEDIT
RECEE
ASSEM
VIDEO
AUD-1
AUD-2
TC
CONTI
START
END
V.SPD
EVENT
LAP
TOTAL
RESET
EJECT
REC
REW
FF
STOP
PLAY
STILL
SRH
PLAYER
IN
OUT
SERVO
SPLIT A1
SPLIT A2
L.EDIT
S61 R VITC/LTC/CTL
S62 P VITC/LTC/CTL
S65 PREROLL 7/5/3
S66 SUMP ON/OFF
PGZ01454
PGZ01478
TO JOG BOARD
CN4
CN5
JOG A-1
JOG B-1
SRH A-1
SRH B-1
STL P-1
JOG A-2
JOG B-2
SRH A-2
SRH B-2
STL P-2
TO LCD
CN2
CN3
RESET
C4~C30 0.01 (IC1~27)
C33~C36 0.01 (IC28,29,31,32)
C37~C40 0.01 (4CORNER AT PWB)
C41~C44 220/16 (4CORNER AT PWB)
C45~C48 220/16 (4CORNER AT PWB)
IC25.3 TC74HC08AP
IC25.4 TC74HC08AP
IC26.5 TC74HC14AP
IC26.6 TC74HC14AP
IC27.2 TC74HC08AP
IC27.3 TC74HC08AP
IC27.4 TC74HC08AP
A
B
C
D
E
F
G
H
1
2
3
4
5
6
Z

–DC voltage:OPERATION (1/2) –

Voltage measurement conditions : The following values are measured with a digital volt meter device in the situation of being not connected to the connector of 9 pin, each of I/O devices and exception of the power supply terminal.

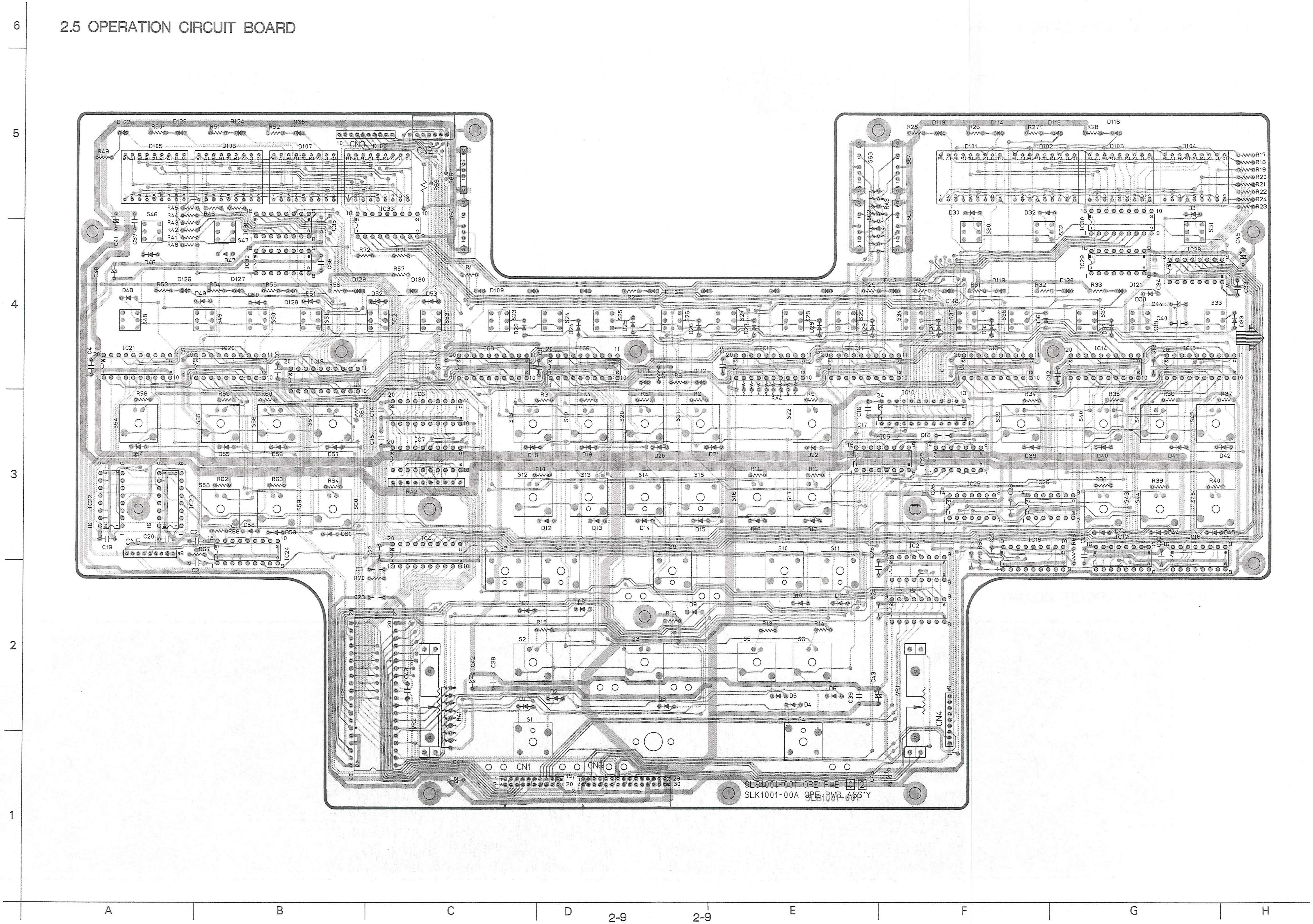
SYMBOL	No.	VOLTAGE
I		C
IC 1	1	2.4
	2	2.6
	3	2.7
	4	2.1
	5	5.0
	6	1.8
	7	4.9
	8	0.0
	9	4.9
	10	4.9
	11	4.9
	12	4.9
	13	4.9
	14	4.9
	15	4.9
	16	4.9
IC 2	1	2.4
	2	2.6
	3	2.7
	4	1.8
	5	4.9
	6	2.1
	7	4.9
	8	0.0
	9	4.9
	10	4.9
	11	4.9
	12	4.9
	13	4.9
	14	4.9
	15	4.9
	16	4.9
IC 3	1	4.9
	2	4.9
	3	2.4
	4	0.0
	5	4.9
	6	4.9
	7	4.9
	8	4.9
	9	-0.0
	10	5.0
	11	4.9
	12	2.4
	13	2.3
	14	2.1
	15	2.5
	16	2.3
	17	2.5
	18	2.4
	19	2.3
	20	0.0
	21	2.4
	22	4.9
	23	3.7
	24	1.9
	25	0.0
	26	0.0
	27	0.0
	28	0.0
	29	0.0
	30	0.0
	31	0.0
	32	2.5
	33	2.5
	34	2.5
	35	2.5
	36	4.9
	37	4.9
	38	4.9
	39	4.9
	40	4.9
IC 4	1	0.0
	2	0.0
	3	0.0
	4	0.0
	5	0.0
	6	0.0
	7	0.0
	8	0.0
IC 4	9	1.9
	10	0.0
	11	1.8
	12	0.0
	13	0.0
	14	0.0
	15	0.0
	16	0.0
	17	0.0
	18	0.0
	19	0.0
	20	4.9
IC 5	1	2.5
	2	2.5
	3	2.5
	4	0.0
	5	0.0
	6	4.9
	7	4.3
	8	0.0
	9	4.3
	10	4.3
	11	4.3
	12	4.3
	13	4.3
	14	4.3
	15	4.3
	16	4.9
IC 6	1	4.9
	2	0.0
	3	2.3
	4	2.4
	5	0.0
	6	0.0
	7	2.6
	8	2.4
	9	0.0
	10	0.0
	11	4.9
	12	4.9
	13	2.6
	14	2.2
	15	4.9
	16	0.0
	17	2.4
	18	2.5
	19	4.9
	20	4.9
IC 7	1	4.9
	2	0.0
	3	2.3
	4	2.4
	5	0.0
	6	0.0
	7	2.6
	8	2.4
	9	0.0
	10	0.0
	11	4.9
	12	0.0
	13	2.6
	14	2.2
	15	0.0
	16	0.0
	17	2.4
	18	2.4
	19	0.0
	20	4.9
IC 8	1	4.9
	2	0.0
	3	2.3
	4	2.4
	5	0.0
	6	0.0
	7	2.6
	8	2.4
	9	0.0
	10	0.0
	11	4.9
	12	0.0
	13	2.6
IC 8	14	2.2
	15	0.0
	16	0.0
	17	2.4
	18	2.4
	19	0.0
	20	4.9
IC 9	1	4.9
	2	0.0
	3	2.3
	4	2.4
	5	0.0
	6	0.0
	7	2.6
	8	2.4
	9	0.0
	10	0.0
	11	4.9
	12	0.0
	13	2.6
	14	2.2
	15	0.0
	16	0.0
	17	2.4
	18	2.4
	19	0.0
	20	4.9
IC10	1	4.9
	2	2.5
	3	2.5
	4	0.2
	5	0.2
	6	0.2
	7	0.2
	8	0.2
	9	0.2
	10	0.2
	11	0.2
	12	0.0
	13	0.2
	14	0.2
	15	0.2
	16	0.2
	17	0.2
	18	0.2
	19	0.2
	20	0.2
	21	2.5
	22	2.5
	23	1.2
	24	4.9
IC11	1	4.9
	2	4.9
	3	2.3
	4	4.9
	5	2.4
	6	4.9
	7	2.6
	8	4.9
	9	2.4
	10	0.0
	11	4.9
	12	2.6
	13	4.9
	14	2.2
	15	4.9
	16	2.4
	17	4.9
	18	2.4
	19	4.9
	20	4.9
IC12	1	4.9
	2	0.0
	3	2.3
	4	4.9
	5	2.4
	6	0.0
	7	2.6
	8	4.9
	9	2.4
	10	0.0
IC12	11	4.9
	12	2.6
	13	4.9
	14	2.2
	15	4.9
	16	2.4
	17	4.9
	18	2.4
	19	4.9
	20	4.9
IC13	1	4.9
	2	0.0
	3	2.3
	4	2.4
	5	0.0
	6	0.0
	7	2.6
	8	2.4
	9	0.0
	10	0.0
	11	4.9
	12	0.0
	13	2.6
	14	2.2
	15	0.0
	16	0.0
	17	2.4
	18	2.5
	19	0.0
	20	4.9
IC14	1	4.9
	2	0.0
	3	2.3
	4	2.4
	5	0.0
	6	0.0
	7	2.6
	8	2.4
	9	0.0
	10	0.0
	11	4.9
	12	0.0
	13	2.6
	14	2.2
	15	0.0
	16	0.0
	17	2.4
	18	2.4
	19	0.0
	20	4.9
IC15	1	4.9
	2	0.0
	3	2.3
	4	0.0
	5	2.4
	6	0.0
	7	2.6
	8	0.0
	9	2.4
	10	0.0
	11	0.0
	12	2.6
	13	0.0
	14	2.2
	15	0.0
	16	2.4
	17	4.9
	18	3.3
	19	4.9
	20	4.9
IC16	1	0.0
	2	0.0
	3	0.0
	4	4.9
	5	4.9
	6	0.0
	7	0.0
	8	0.0
	9	0.0
	10	0.0
	11	4.9
IC16	12	4.9
	13	4.9
	14	0.0
	15	0.0
	16	4.9
IC17	1	0.0
	2	0.0
	3	0.0
	4	4.9
	5	4.9
	6	0.0
	7	0.0
	8	0.0
	9	0.0
	10	0.0
	11	4.9
	12	4.9
	13	4.9
	14	0.0
	15	0.0
	16	4.9
IC18	1	2.4
	2	2.3
	3	0.0
	4	0.0
	5	4.9
	6	4.9
	7	4.9
	8	4.9
	9	0.0
	10	0.0
	11	4.9
	12	0.0
	13	4.9
	14	4.9
	15	4.9
	16	0.0
	17	4.9
	18	4.9
IC19	1	4.9
	2	0.0
	3	2.3
	4	2.4
	5	0.0
	6	0.0
	7	2.6
	8	1.7
	9	4.6
	10	0.0
	11	4.9
	12	0.0
	13	3.4
	14	1.1
	15	0.0
	16	0.0
	17	2.4
	18	3.4
	19	0.0
	20	4.9
IC20	1	4.9
	2	0.0
	3	2.3
	4	2.4
	5	0.0
	6	0.0
	7	2.6
	8	1.7
	9	0.0
	10	0.0
	11	4.9
	12	0.0
	13	3.4
	14	1.1
	15	0.0
	16	0.0
	17	2.4
	18	3.4
	19	0.0
	20	4.9

–DC voltage:OPERATION (2/2) –

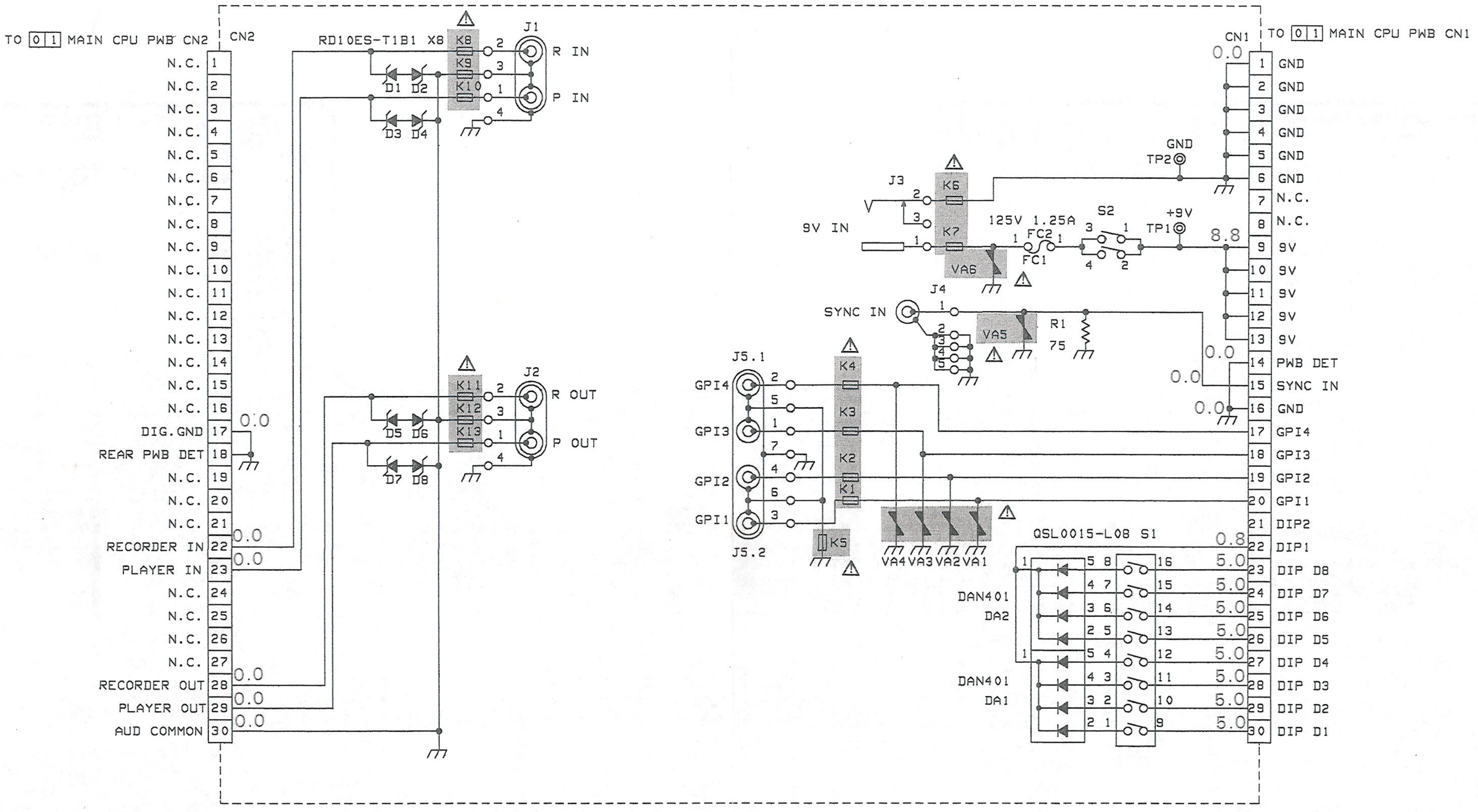
Voltage measurement conditions : The following values are measured with a digital volt meter device in the situation of being not connected to the connector of 9 pin, each of I/O devices and exception of the power supply terminal.

SYMBOL	No.	VOLTAGE
I		C
IC21	1	4.9
	2	0.0
	3	2.3
	4	0.0
	5	2.4
	6	0.0
	7	2.6
	8	0.0
	9	1.7
	10	0.0
	11	0.0
	12	3.4
	13	0.0
	14	1.1
	15	0.0
	16	2.4
	17	0.0
	18	3.4
	19	4.9
	20	4.9
IC22	1	0.0
	2	0.0
	3	0.0
	4	4.9
	5	4.9
	6	0.0
	7	0.0
	8	0.0
	9	0.0
	10	0.0
	11	0.0
	12	4.9
	13	4.9
	14	0.0
	15	0.0
	16	4.9
IC23	1	0.0
	2	0.0
	3	0.0
	4	4.9
	5	4.9
	6	0.0
	7	0.0
	8	0.0
	9	0.0
	10	0.0
	11	0.0
	12	4.9
	13	4.9
	14	0.0
	15	0.0
	16	4.9
IC24	1	2.4
	2	2.3
	3	0.0
	4	0.0
	5	4.9
	6	4.9
	7	4.9
	8	4.9
	9	0.0
	10	0.0
	11	4.9
	12	4.9
	13	0.0
	14	4.9
	15	4.9
	16	4.9
	17	4.9
	18	4.9
IC25	1	0.0
	2	4.9
	3	4.9
	4	0.0
	5	0.0
	6	4.9
	7	0.0
	8	4.9
	9	0.0
IC25	10	0.0
	11	4.9
	12	0.0
	13	0.0
	14	4.9
IC26	1	4.9
	2	0.0
	3	4.9
	4	0.0
	5	0.0
	6	4.9
	7	0.0
	8	1.2
	9	3.7
	10	4.9
	11	0.0
	12	4.9
	13	0.0
	14	4.9
IC27	1	2.5
	2	2.4
	3	1.2
	4	0.0
	5	0.0
	6	0.0
	7	0.0
	8	0.0
	9	0.0
	10	0.0
	11	0.0
	12	0.0
	13	0.0
	14	4.9
IC28	1	0.3
	2	0.3
	3	0.3
	4	0.3
	5	0.3
	6	0.3
	7	0.3
	8	8.7
	9	0.0
	10	0.0
	11	0.0
	12	0.0
	13	0.0
	14	0.0
	15	0.0
	16	0.0
IC29	1	6.4
	2	—
	3	—
	4	—
	5	—
	6	—
	7	—
	8	8.7
	9	0.0
	10	0.0
	11	0.0
	12	0.0
	13	0.0
	14	0.0
	15	0.0
	16	1.8
IC30	1	0.2
	2	0.2
	3	0.2
	4	0.2
	5	0.2
	6	0.2
	7	0.2
	8	0.2
	9	0.0
	10	5.4
	11	5.1
	12	5.1
	13	5.1
	14	5.1
	15	5.1
IC30	16	5.1
	17	5.1
	18	5.1
IC31	1	0.0
	2	0.0
	3	0.3
	4	0.3
	5	0.3
	6	0.3
	7	0.3
	8	8.7
	9	0.0
	10	0.0
	11	0.0
	12	0.0
	13	0.0
	14	0.0
	15	0.0
	16	0.0
IC32	1	6.3
	2	—
	3	—
	4	—
	5	—
	6	—
	7	—
	8	8.7
	9	0.0
	10	0.0
	11	0.0
	12	0.0
	13	0.0
	14	0.0
	15	0.0
	16	1.8
IC33	1	0.2
	2	0.2
	3	0.2
	4	0.2
	5	0.2
	6	0.2
	7	0.2
	8	0.2
	9	0.0
	10	5.3
	11	5.0
	12	5.0
	13	5.0
	14	4.9
	15	5.0
	16	4.9
	17	5.0
	18	5.0
CONNECTOR		
CN 1	1	0.8
	2	0.8
	3	0.8
	4	0.8
	5	0.8
	6	0.8
	7	2.5
	8	2.2
	9	0.0
	10	0.0
	11	2.4
	12	2.4
	13	2.4
	14	2.1
	15	1.2
	16	2.0
	17	2.2
	18	2.1
	19	0.0
	20	0.0
CN 2	1	0.0
	2	4.9
	3	0.0
	4	0.0
	5	0.0
	6	0.0
CN 3	1	4.9
	2	0.0
	3	4.9
	4	4.9
	5	0.0
	6	0.0
	7	0.0
	8	0.0
	9	4.9
	10	1.0
CN 4	1	4.9
	2	0.0
	3	0.0
	4	0.0
	5	4.9
	6	4.9
	7	—
	8	0.0
	9	0.0
CN 5	1	4.9
	2	4.9
	3	0.0
	4	4.9
	5	4.9
	6	0.0
	7	—
	8	0.0
	9	0.0
CN 6	1	2.4
	2	0.0
	3	0.0
	4	5.0
	5	4.9
	6	4.9
	7	0.0
	8	0.0
	9	0.0
	10	4.9
	11	0.0
	12	0.0
	13	0.0
	14	—
	15	0.0
	16	0.0
	17	0.0
	18	0.0
	19	0.0
	20	—
	21	—
	22	—
	23	—
	24	8.7
CN 6	25	8.7
	26	4.9
	27	4.9
	28	4.9
	29	0.0
	30	0.0

2.5 OPERATION CIRCUIT BOARD

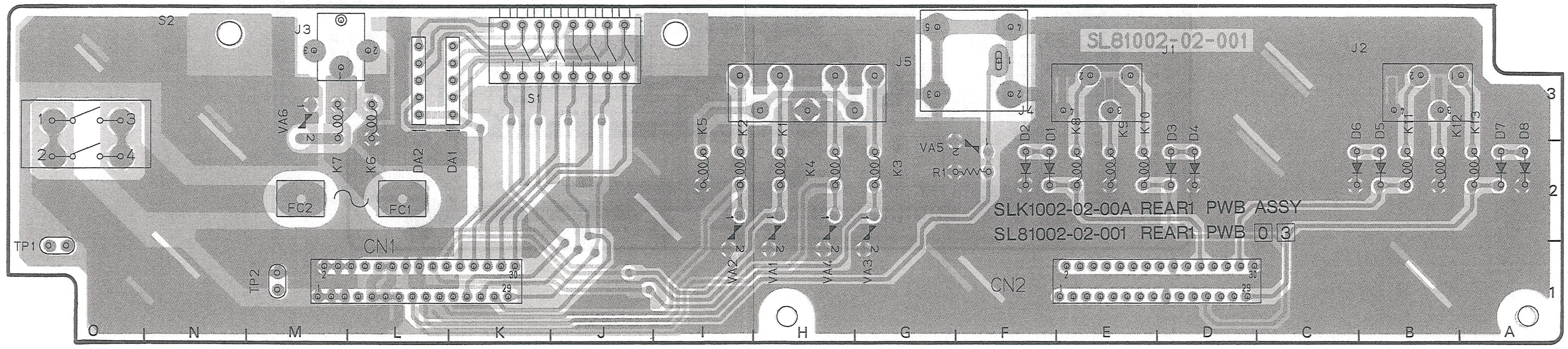

6
5
4
3
2
1
A
B
C
D
E
F
G
H
CN1
CN2
CN3
CN4
CN5
CN6
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC14
IC15
IC16
IC17
IC18
IC19
IC20
IC21
IC22
IC23
IC24
IC25
IC26
IC27
IC28
IC29
IC30
IC31
IC32
IC33
RA1
RA2
RA4
VR1
VR2
D101
D102
D103
D104
D105
D106
D107
D108
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
SL81001-001 OPE PWB 02
SLK1001-00A OPE PWB ASS'Y

2.6 REAR-1 SCHEMATIC DIAGRAM


TO 01 MAIN CPU PWB CN2
CN2
N.C. 1
N.C. 2
N.C. 3
N.C. 4
N.C. 5
N.C. 6
N.C. 7
N.C. 8
N.C. 9
N.C. 10
N.C. 11
N.C. 12
N.C. 13
N.C. 14
N.C. 15
N.C. 16
DIG.GND 17
REAR PWB DET 18
N.C. 19
N.C. 20
N.C. 21
RECORDER IN 22
PLAYER IN 23
N.C. 24
N.C. 25
N.C. 26
N.C. 27
RECORDER OUT 28
PLAYER OUT 29
AUD COMMON 30
0.0
RD10ES-T1B1 X8
K8
K9
K10
D1 D2
D3 D4
J1
R IN
P IN
K11
K12
K13
D5 D6
D7 D8
J2
R OUT
P OUT
J3
K6
K7
9V IN
125V 1.25A
FC2
FC1
VA6
S2
+9V
TP1
GND
TP2
J4
SYNC IN
VA5
R1
75
J5.1
J5.2
GPI4
GPI3
GPI2
GPI1
K4
K3
K2
K1
K5
VA4 VA3 VA2 VA1
QSL0015-L08 S1
DAN401
DA2
DAN401
DA1
CN1
TO 01 MAIN CPU PWB CN1
1 GND
2 GND
3 GND
4 GND
5 GND
6 GND
7 N.C.
8 N.C.
9 9V
10 9V
11 9V
12 9V
13 9V
14 PWB DET
15 SYNC IN
16 GND
17 GPI4
18 GPI3
19 GPI2
20 GPI1
21 DIP2
22 DIP1
23 DIP D8
24 DIP D7
25 DIP D6
26 DIP D5
27 DIP D4
28 DIP D3
29 DIP D2
30 DIP D1
8.8
0.8
5.0

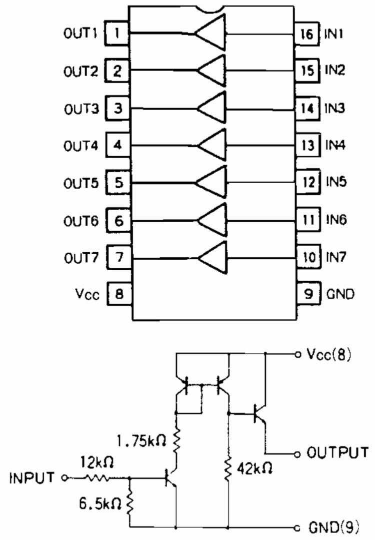
NOTES:UNLESS OTHERWISE SPECIFIED
ALL RESISTANCE VALUES ARE IN OHMS.(1/6W)

2.7 REAR-1 CIRCUIT BOARD


S2
J3
VA6
K7
K6
DA2
DA1
FC2
FC1
S1
CN1
TP1
TP2
K5
K2
K1
K4
K3
VA2
VA1
VA4
VA3
J5
J4
VA5
R1
D2
D1
K8
K9
K10
D3
D4
J1
J2
D6
D5
K11
K12
K13
D7
D8
CN2
SL81002-02-001
SLK1002-02-00A REAR1 PWB ASSY
SL81002-02-001 REAR1 PWB 03
O
N
M
L
K
J
I
H
G
F
E
D
C
B
A

—BA618—

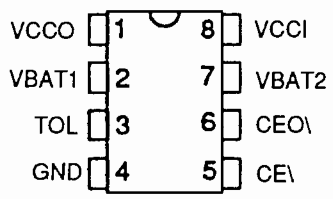
LED Driver



OUT1 1
OUT2 2
OUT3 3
OUT4 4
OUT5 5
OUT6 6
OUT7 7
Vcc 8
16 IN1
15 IN2
14 IN3
13 IN4
12 IN5
11 IN6
10 IN7
9 GND
Vcc(8)
1.75kΩ
12kΩ
INPUT
6.5kΩ
42kΩ
OUTPUT
GND(9)

—DS1210—

Nonvolatile Controller



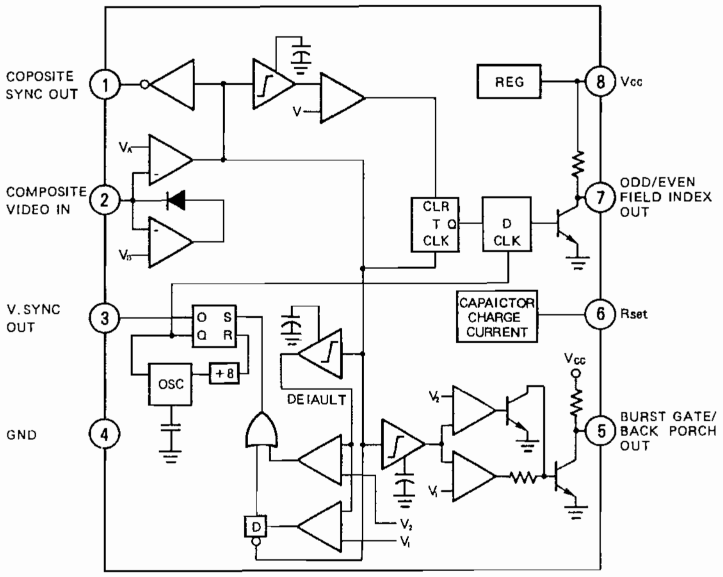
VCCO 1
VBAT1 2
TOL 3
GND 4
8 VCCI
7 VBAT2
6 CEO\
5 CE\

[Terminal Description]

Pin No.	Description
1	RAM SUPPLY
2	+ BATTERY 1
3	POWER SUPPLY TOLERANCE
4	GND
5	CHIP ENABLE INPUT
6	CHIP ENABLE OUTPUT
7	+ BATTERY 2
8	+ SUPPLY

—LM1881—

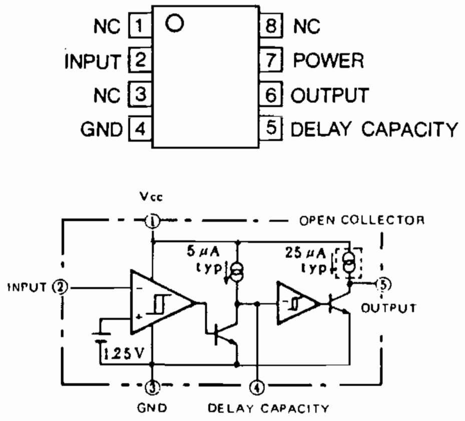
VIDEO sync separator



COPOSITE SYNC OUT 1
COMPOSITE VIDEO IN 2
V.SYNC OUT 3
GND 4
REG
8 Vcc
ODD/EVEN FIELD INDEX OUT 7
6 Rset
BURST GATE/ BACK PORCH OUT 5
CLR T Q CLK
D CLK
CAPAICTOR CHARGE CURRENT
O S Q R
OSC
÷8
DEIAULT
D
Vcc

—M51957BL—

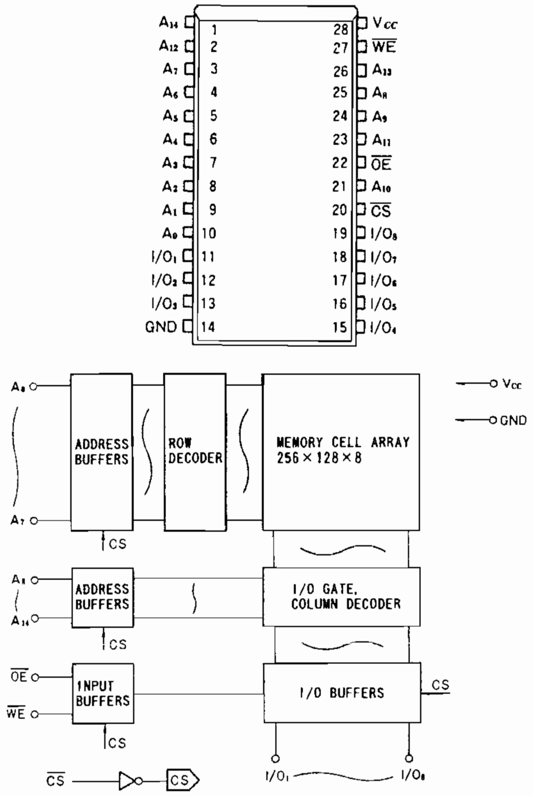
Voltage Detector/System Reset



NC 1
INPUT 2
NC 3
GND 4
8 NC
7 POWER
6 OUTPUT
5 DELAY CAPACITY
Vcc
OPEN COLLECTOR
INPUT 2
5μA typ
25μA typ
OUTPUT
1.25V
GND
DELAY CAPACITY

—MB84256A—10L—

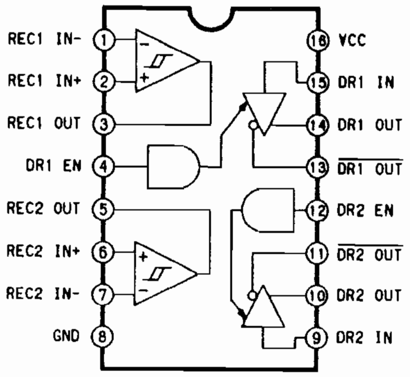
256K (32Kx8) bit CMOS Static RAM



A14 1
A12 2
A7 3
A6 4
A5 5
A4 6
A3 7
A2 8
A1 9
A0 10
I/O1 11
I/O2 12
I/O3 13
GND 14
28 Vcc
27 WE
26 A13
25 A8
24 A9
23 A11
22 OE
21 A10
20 CS
19 I/O8
18 I/O7
17 I/O6
16 I/O5
15 I/O4
ADDRESS BUFFERS
ROW DECODER
MEMORY CELL ARRAY 256×128×8
Vcc
GND
ADDRESS BUFFERS
I/O GATE, COLUMN DECODER
INPUT BUFFERS
I/O BUFFERS
CS
OE
WE
I/O1
I/O8

—MC34051P—

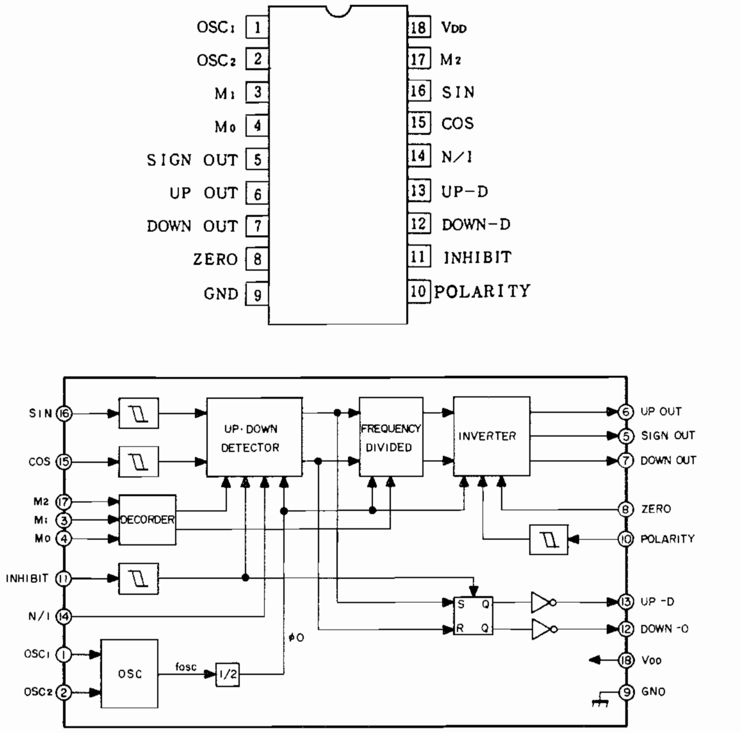
Dual RS-422/423 Transeiver



REC1 IN- 1
REC1 IN+ 2
REC1 OUT 3
DR1 EN 4
REC2 OUT 5
REC2 IN+ 6
REC2 IN- 7
GND 8
16 VCC
15 DR1 IN
14 DR1 OUT
13 DR1 OUT
12 DR2 EN
11 DR2 OUT
10 DR2 OUT
9 DR2 IN

—MSM5210RS—

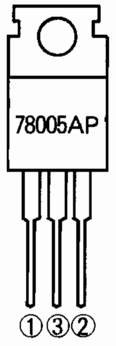
UP/Down Detector



OSC1 1
OSC2 2
M1 3
M0 4
SIGN OUT 5
UP OUT 6
DOWN OUT 7
ZERO 8
GND 9
18 VDD
17 M2
16 SIN
15 COS
14 N/I
13 UP-D
12 DOWN-D
11 INHIBIT
10 POLARITY
SIN
COS
M2
M1
M0
INHIBIT
N/I
OSC1
OSC2
UP·DOWN DETECTOR
FREQUENCY DIVIDED
INVERTER
DECORDER
OSC
fosc
1/2
φ0
S Q
R Q
UP OUT
SIGN OUT
DOWN OUT
ZERO
POLARITY
UP-D
DOWN-D
VDD
GND

—TA78005AP—

Regulator



①③②

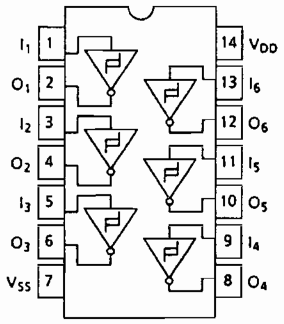
① : INPUT

② : OUTPUT

③ : GND

—TC4584BP—

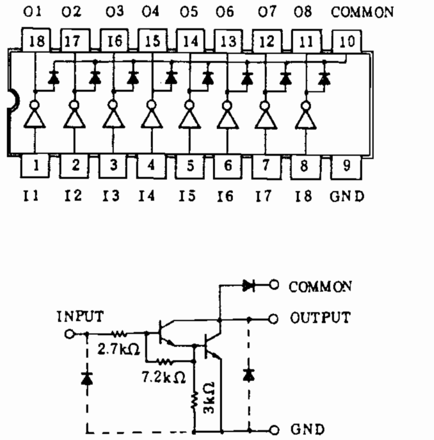
Hex Schmitt Trigger



I1 1
O1 2
I2 3
O2 4
I3 5
O3 6
VSS 7
14 VDD
13 I6
12 O6
11 I5
10 O5
9 I4
8 O4

—TD62083AP—

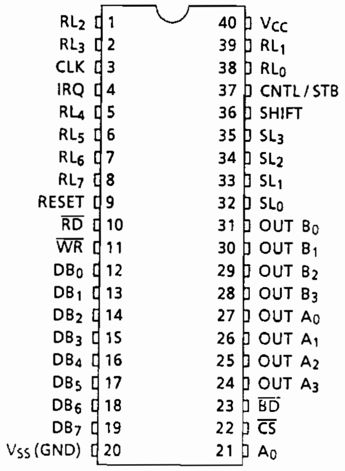
8-ch Darlington Driver

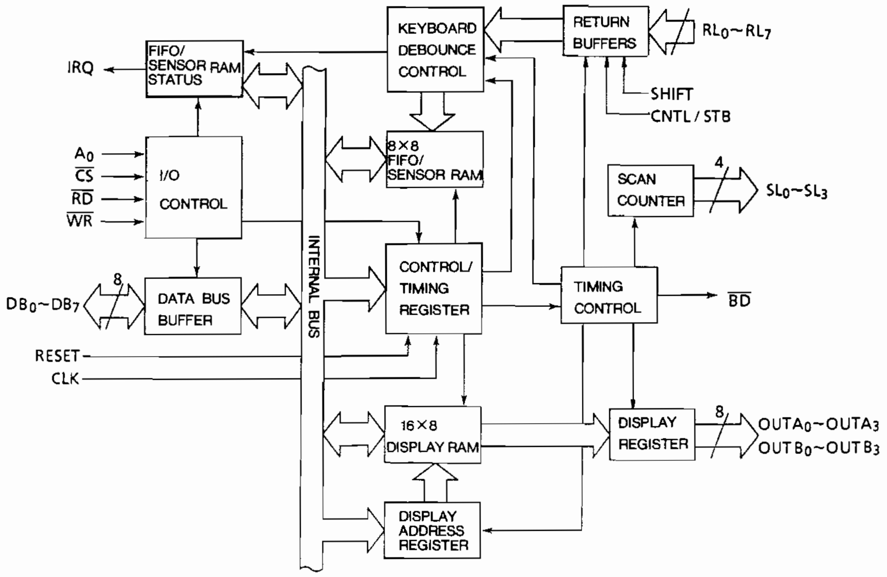


O1 O2 O3 O4 O5 O6 O7 O8 COMMON
18 17 16 15 14 13 12 11 10
1 2 3 4 5 6 7 8 9
I1 I2 I3 I4 I5 I6 I7 I8 GND
INPUT
2.7kΩ
7.2kΩ
3kΩ
COMMON
OUTPUT
GND

−TMP82C79P−2−

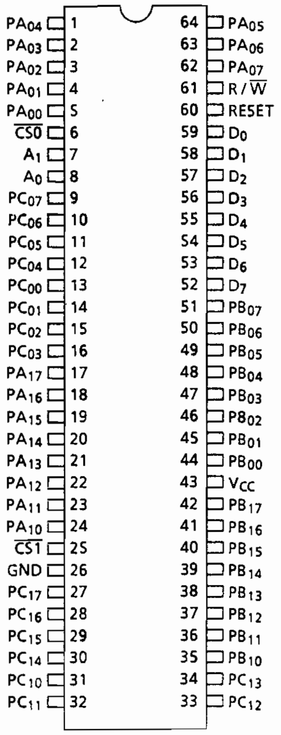
Programmable keyboard/Display Interface

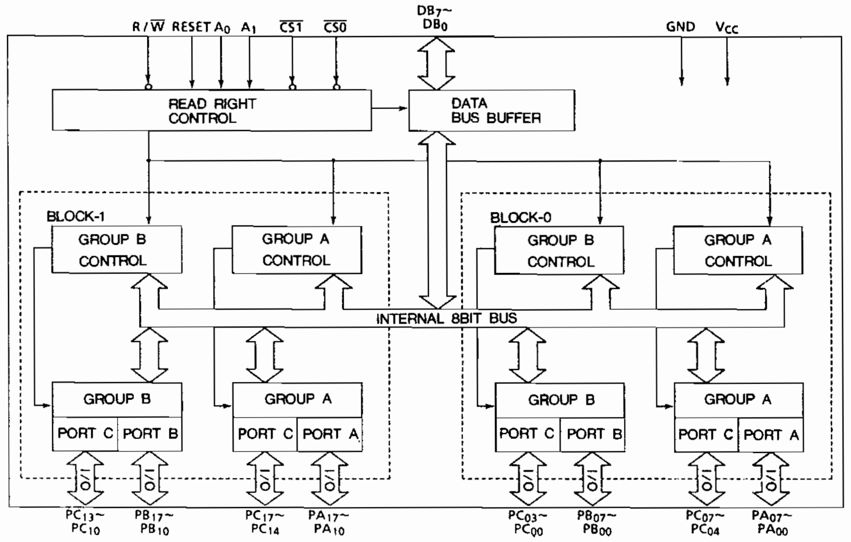

RL2 1
RL3 2
CLK 3
IRQ 4
RL4 5
RL5 6
RL6 7
RL7 8
RESET 9
RD 10
WR 11
DB0 12
DB1 13
DB2 14
DB3 15
DB4 16
DB5 17
DB6 18
DB7 19
VSS (GND) 20
40 VCC
39 RL1
38 RL0
37 CNTL/STB
36 SHIFT
35 SL3
34 SL2
33 SL1
32 SL0
31 OUT B0
30 OUT B1
29 OUT B2
28 OUT B3
27 OUT A0
26 OUT A1
25 OUT A2
24 OUT A3
23 BD
22 CS
21 A0


IRQ
FIFO/SENSOR RAM STATUS
KEYBOARD DEBOUNCE CONTROL
RETURN BUFFERS
RL0~RL7
SHIFT
CNTL/STB
A0
CS
RD
WR
I/O CONTROL
8×8 FIFO/SENSOR RAM
SCAN COUNTER
4
SL0~SL3
DB0~DB7
8
DATA BUS BUFFER
INTERNAL BUS
CONTROL/TIMING REGISTER
TIMING CONTROL
BD
RESET
CLK
16×8 DISPLAY RAM
DISPLAY REGISTER
8
OUTA0~OUTA3
OUTB0~OUTB3
DISPLAY ADDRESS REGISTER

−TMP82C255AN−2−

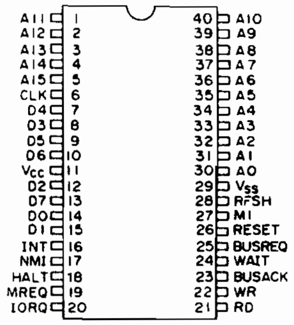
Programmable Peripherel Interface

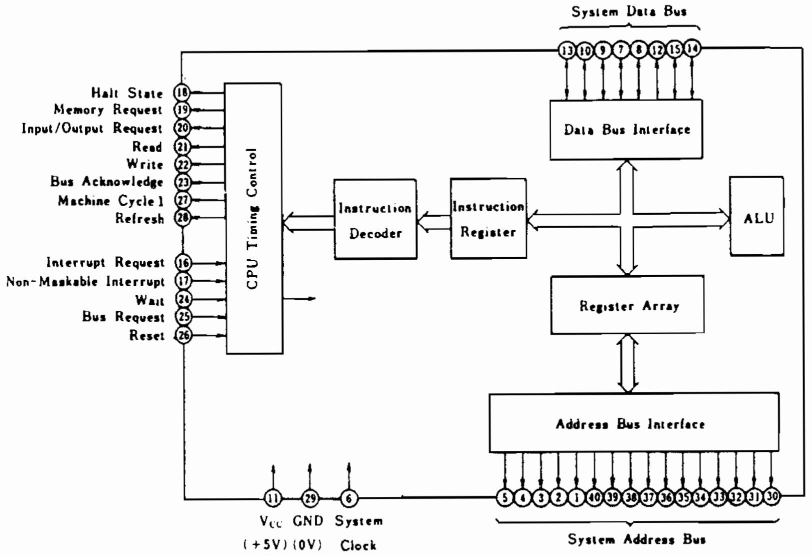

PA04 1
PA03 2
PA02 3
PA01 4
PA00 5
CS0 6
A1 7
A0 8
PC07 9
PC06 10
PC05 11
PC04 12
PC00 13
PC01 14
PC02 15
PC03 16
PA17 17
PA16 18
PA15 19
PA14 20
PA13 21
PA12 22
PA11 23
PA10 24
CS1 25
GND 26
PC17 27
PC16 28
PC15 29
PC14 30
PC10 31
PC11 32
64 PA05
63 PA06
62 PA07
61 R/W
60 RESET
59 D0
58 D1
57 D2
56 D3
55 D4
54 D5
53 D6
52 D7
51 PB07
50 PB06
49 PB05
48 PB04
47 PB03
46 PB02
45 PB01
44 PB00
43 VCC
42 PB17
41 PB16
40 PB15
39 PB14
38 PB13
37 PB12
36 PB11
35 PB10
34 PC13
33 PC12


R/W RESET A0 A1 CS1 CS0
DB7~DB0
GND VCC
READ RIGHT CONTROL
DATA BUS BUFFER
BLOCK-1
BLOCK-0
GROUP B CONTROL
GROUP A CONTROL
INTERNAL 8BIT BUS
GROUP B
GROUP A
PORT C
PORT B
PORT A
PC13~PC10
PB17~PB10
PC17~PC14
PA17~PA10
PC03~PC00
PB07~PB00
PC07~PC04
PA07~PA00

−TMPZ84C00AP−6−

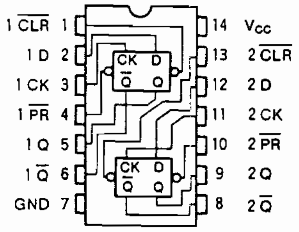
Z80CPU (Central Processing Unit)


A11 1
A12 2
A13 3
A14 4
A15 5
CLK 6
D4 7
D3 8
D5 9
D6 10
Vcc 11
D2 12
D7 13
D0 14
D1 15
INT 16
NMI 17
HALT 18
MREQ 19
IORQ 20
40 A10
39 A9
38 A8
37 A7
36 A6
35 A5
34 A4
33 A3
32 A2
31 A1
30 A0
29 Vss
28 RFSH
27 M1
26 RESET
25 BUSREQ
24 WAIT
23 BUSACK
22 WR
21 RD


System Data Bus
13 10 9 7 8 12 15 14
Halt State 18
Memory Request 19
Input/Output Request 20
Read 21
Write 22
Bus Acknowledge 23
Machine Cycle 1 27
Refresh 28
Interrupt Request 16
Non-Maskable Interrupt 17
Wait 24
Bus Request 25
Reset 26
CPU Timing Control
Data Bus Interface
Instruction Decoder
Instruction Register
ALU
Register Array
Address Bus Interface
5 4 3 2 1 40 39 38 37 36 35 34 33 32 31 30
System Address Bus
11 29 6
Vcc (+5V) GND (0V) System Clock

−TC74HC74AP−

Dual D Flip-Flop with Preset and clear

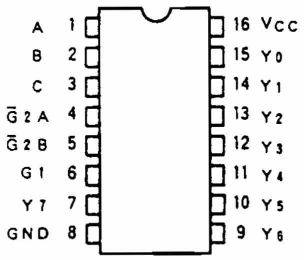

1 CLR 1
1 D 2
1 CK 3
1 PR 4
1 Q 5
1 Q 6
GND 7
14 Vcc
13 2 CLR
12 2D
11 2CK
10 2PR
9 2Q
8 2Q
CK D
Q Q

INPUTS				OUTPUTS		FUNCTION
$\overline{CLR}$	$\overline{PR}$	D	CK	Q	$\overline{Q}$	
L	H	X	X	L	H	CLEAR
H	L	X	X	H	L	PRESET
L	L	X	X	H	H	—
H	H	L	↑	L	H	—
H	H	H	↑	H	L	—
H	H	X	↓	Q_n	$\overline{Q}_n$	NO CHANGE

X : Don't care

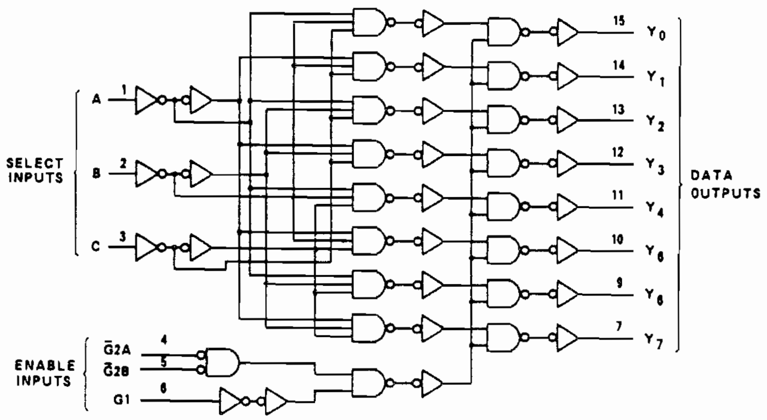
−TC74HC138AP−

3-to-8 Line Decoder


A 1
B 2
C 3
G2A 4
G2B 5
G1 6
Y7 7
GND 8
16 Vcc
15 Y0
14 Y1
13 Y2
12 Y3
11 Y4
10 Y5
9 Y6

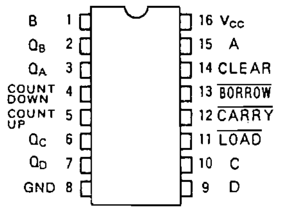
INPUTS						OUTPUTS								SELECTED OUTPUT
ENABLE			SELECT											
G1	$\overline{G2A}$	$\overline{G2B}$	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	
L	X	X	X	X	X	L	L	L	L	L	L	L	L	NONE
X	H	X	X	X	X	L	L	L	L	L	L	L	L	NONE
X	X	H	X	X	X	L	L	L	L	L	L	L	L	NONE
H	L	L	L	L	L	H	L	L	L	L	L	L	L	Y0
H	L	L	L	L	H	L	H	L	L	L	L	L	L	Y1
H	L	L	L	H	L	L	L	H	L	L	L	L	L	Y2
H	L	L	L	H	H	L	L	L	H	L	L	L	L	Y3
H	L	L	H	L	L	L	L	L	L	H	L	L	L	Y4
H	L	L	H	L	H	L	L	L	L	L	H	L	L	Y5
H	L	L	H	H	L	L	L	L	L	L	L	H	L	Y6
H	L	L	H	H	H	L	L	L	L	L	L	L	H	Y7

X:Don't care


SELECT INPUTS
A 1
B 2
C 3
ENABLE INPUTS
G2A 4
G2B 5
G1 6
15 Y0
14 Y1
13 Y2
12 Y3
11 Y4
10 Y5
9 Y6
7 Y7
DATA OUTPUTS

-TC74HC193AP-

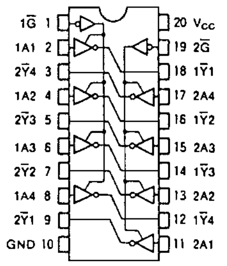
Synchronous Up/Down Binary Counter


B 1
QB 2
QA 3
COUNT DOWN 4
COUNT UP 5
QC 6
QD 7
GND 8
16 Vcc
15 A
14 CLEAR
13 BORROW
12 CARRY
11 LOAD
10 C
9 D

INPUTS				FUNCTION
COUNT UP	COUNT DOWN	$\overline{\text{LOAD}}$	CLEAR	
_┌	H	H	L	COUNT UP
‾┐_	H	H	L	NO COUNT
H	_┌	H	L	COUNT DOWN
H	‾┐_	H	L	NO COUNT
X	X	L	L	PRESET
X	X	X	H	RESET

-TC74HC240AP-

Octal Bus Buffer (3-State)

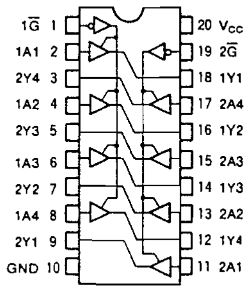

1G̅ 1
1A1 2
2Y̅4 3
1A2 4
2Y̅3 5
1A3 6
2Y̅2 7
1A4 8
2Y̅1 9
GND 10
20 Vcc
19 2G̅
18 1Y̅1
17 2A4
16 1Y̅2
15 2A3
14 1Y̅3
13 2A2
12 1Y̅4
11 2A1

INPUTS		OUTPUTS
$\overline{G}$	A_n	$\overline{Y_n}$
L	L	H
L	H	L
H	X	Z

X : Don't Care
Z : High Impedance

-TC74HC244AP-

Octal Bus Buffer (3-state)

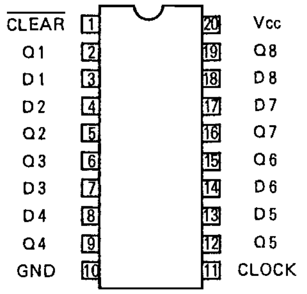

1G̅ 1
1A1 2
2Y4 3
1A2 4
2Y3 5
1A3 6
2Y2 7
1A4 8
2Y1 9
GND 10
20 Vcc
19 2G̅
18 1Y1
17 2A4
16 1Y2
15 2A3
14 1Y3
13 2A2
12 1Y4
11 2A1

INPUTS		OUTPUTS
$\overline{G}$	A_n	Y_n
L	L	L
L	H	H
H	X	Z

X : Don't Care
Z : High Impedance

-TC74HC273AP/AF-

OCTALD-TYPE FLIP FLOP WITH CLEAR

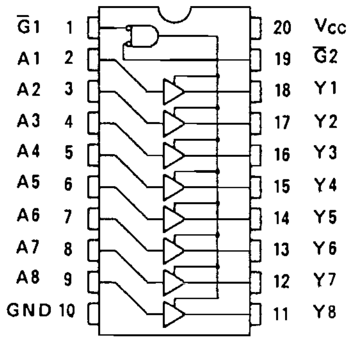

CLEAR 1
Q1 2
D1 3
D2 4
Q2 5
Q3 6
D3 7
D4 8
Q4 9
GND 10
20 Vcc
19 Q8
18 D8
17 D7
16 Q7
15 Q6
14 D6
13 D5
12 Q5
11 CLOCK

INPUTS			OUTPUTS	FUNCTION
$\overline{\text{CLEAR}}$	D	CLOCK	Q	
L	X	X	L	Clear
H	L	_┌	L	–
H	H	_┌	H	–
H	X	‾┐_	Q_n	No change

X:Don't care

-TC74HC541AP-

Octal Bus Buffer (3-state)

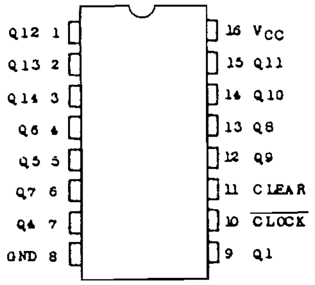

G̅1 1
A1 2
A2 3
A3 4
A4 5
A5 6
A6 7
A7 8
A8 9
GND 10
20 Vcc
19 G̅2
18 Y1
17 Y2
16 Y3
15 Y4
14 Y5
13 Y6
12 Y7
11 Y8

INPUTS			OUTPUTS
$\overline{G1}$	$\overline{G2}$	An	Yn
H	X	X	Z
X	H	X	Z
L	L	H	H
L	L	L	L

X : Don't care
Z : High impedance

-TC74HC4020AP/AF-

14-stage Binary Counter


Q12 1
Q13 2
Q14 3
Q6 4
Q5 5
Q7 6
Q4 7
GND 8
16 VCC
15 Q11
14 Q10
13 Q8
12 Q9
11 CLEAR
10 CLOCK
9 Q1

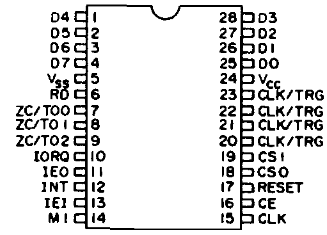
TRUTH TABLE

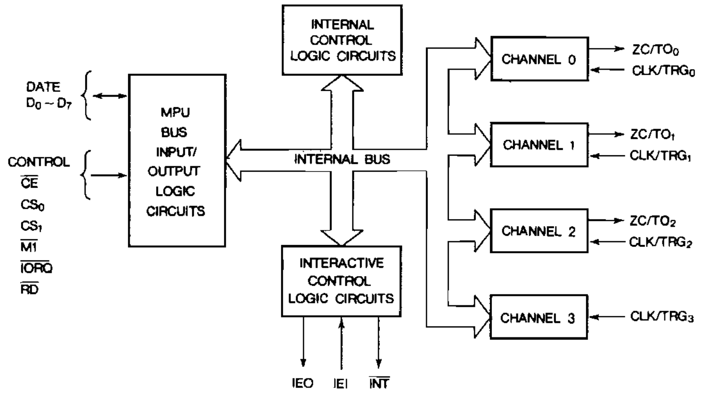
$\overline{\text{CLOCK}}$	CLEAR	OUTPUT STATE
X	H	ALL OUTPUTS = 'L'
_┌	L	NO CHANGE
‾┐_	L	ADVANCE TO NEXT STATE

X : DON'T CARE

-TMPZ84C30AP-6-

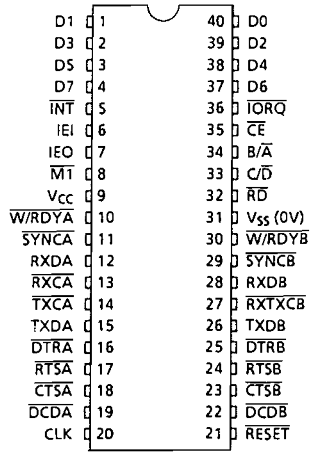
Counter Timer Circuit

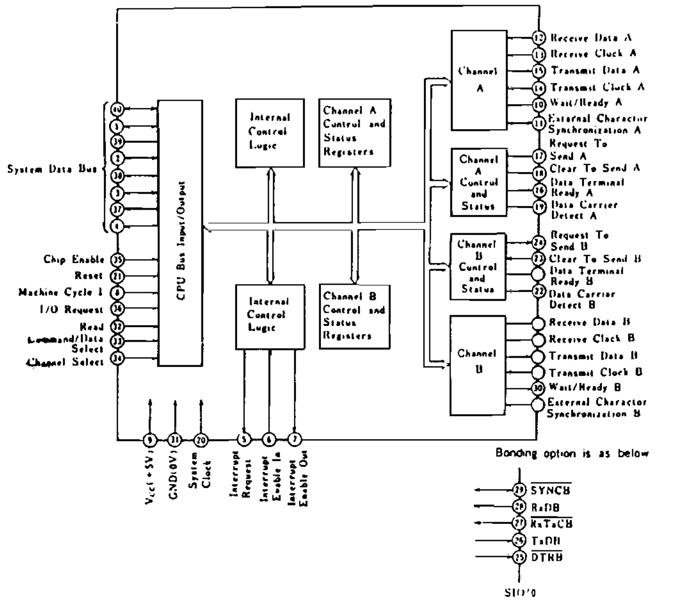

D4 1
D5 2
D6 3
D7 4
Vss 5
RD 6
ZC/TO0 7
ZC/TO1 8
ZC/TO2 9
IORQ 10
IEO 11
INT 12
IEI 13
M1 14
28 D3
27 D2
26 D1
25 D0
24 Vcc
23 CLK/TRG0
22 CLK/TRG1
21 CLK/TRG2
20 CLK/TRG
19 CS1
18 CS0
17 RESET
16 CE
15 CLK


DATE D0-D7
CONTROL
CE
CS0
CS1
M1
IORQ
RD
MPU BUS INPUT/OUTPUT LOGIC CIRCUITS
INTERNAL CONTROL LOGIC CIRCUITS
INTERNAL BUS
INTERACTIVE CONTROL LOGIC CIRCUITS
IEO
IEI
INT
CHANNEL 0
ZC/TO0
CLK/TRG0
CHANNEL 1
ZC/TO1
CLK/TRG1
CHANNEL 2
ZC/TO2
CLK/TRG2
CHANNEL 3
CLK/TRG3

-TMPZ84C40AP-6-

Serial I/O Controller

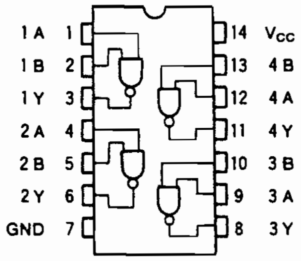

D1 1
D3 2
D5 3
D7 4
INT 5
IEI 6
IEO 7
M1 8
Vcc 9
W/RDYA 10
SYNCA 11
RXDA 12
RXCA 13
TXCA 14
TXDA 15
DTRA 16
RTSA 17
CTSA 18
DCDA 19
CLK 20
40 D0
39 D2
38 D4
37 D6
36 IORQ
35 CE
34 B/A
33 C/D
32 RD
31 VSS (0V)
30 W/RDYB
29 SYNCB
28 RXDB
27 RXTXCB
26 TXDB
25 DTRB
24 RTSB
23 CTSB
22 DCDB
21 RESET


System Data Bus
Chip Enable
Reset
Machine Cycle 1
I/O Request
Read
Command/Data Select
Channel Select
CPU Bus Input/Output
Internal Control Logic
Channel A Control and Status Registers
Internal Control Logic
Channel B Control and Status Registers
Channel A
Channel A Control and Status
Channel B Control and Status
Channel B
Receive Data A
Receive Clock A
Transmit Data A
Transmit Clock A
Wait/Ready A
External Character Synchronization A
Request To Send A
Clear To Send A
Data Terminal Ready A
Data Carrier Detect A
Request To Send B
Clear To Send B
Data Terminal Ready B
Data Carrier Detect B
Receive Data B
Receive Clock B
Transmit Data B
Transmit Clock B
Wait/Ready B
External Character Synchronization B
Vcc(+5V)
GND(0V)
System Clock
Interrupt Request
Interrupt Enable In
Interrupt Enable Out
Bonding option is as below
SYNCB
RxDB
RxTxCB
TxDB
DTRB
SIO/0

74 Families of Compatible TTL Circuits

-TC74HC00AP-

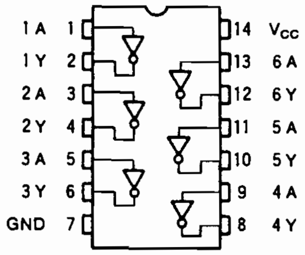
Quad 2-Input NAND Gate


1A 1
1B 2
1Y 3
2A 4
2B 5
2Y 6
GND 7
14 Vcc
13 4B
12 4A
11 4Y
10 3B
9 3A
8 3Y

A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

-TC74HC04AP-

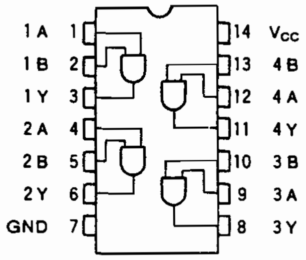
Hex Inverter


1A 1
1Y 2
2A 3
2Y 4
3A 5
3Y 6
GND 7
14 Vcc
13 6A
12 6Y
11 5A
10 5Y
9 4A
8 4Y

A	Y
L	H
H	L

-TC74HC08AP-

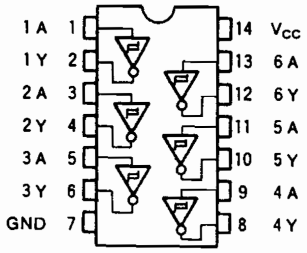
Quad 2-Input AND Gate


1A 1
1B 2
1Y 3
2A 4
2B 5
2Y 6
GND 7
14 Vcc
13 4B
12 4A
11 4Y
10 3B
9 3A
8 3Y

A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

-TC74HC14AP-

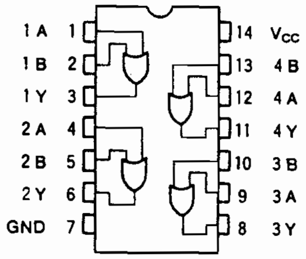
Hex schmitt Inverter


1A 1
1Y 2
2A 3
2Y 4
3A 5
3Y 6
GND 7
14 Vcc
13 6A
12 6Y
11 5A
10 5Y
9 4A
8 4Y

A	Y
L	H
H	L

-TC74HC32AP-

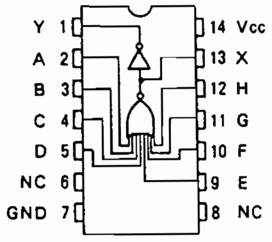
Quad 2-Input OR Gate


1A 1
1B 2
1Y 3
2A 4
2B 5
2Y 6
GND 7
14 Vcc
13 4B
12 4A
11 4Y
10 3B
9 3A
8 3Y

A	B	Y
H	H	H
L	H	H
H	L	H
L	L	L

-TC74HC4078AP-

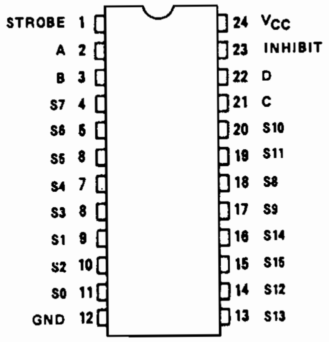
8-Input OR/NOR Gate


Y 1
A 2
B 3
C 4
D 5
NC 6
GND 7
14 Vcc
13 X
12 H
11 G
10 F
9 E
8 NC

NC:No Connection

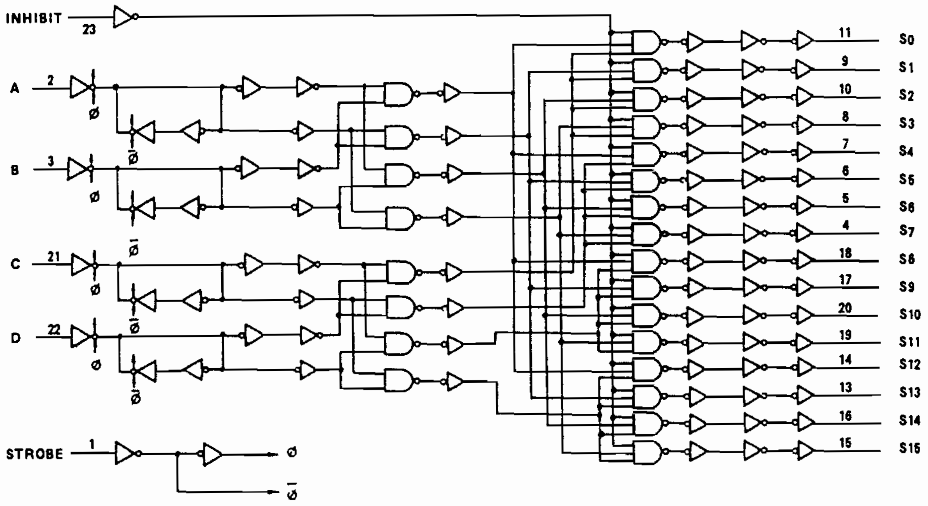
-TC74HC4514AP-

4-to-16 Line Decoder/Latch


STROBE 1
A 2
B 3
S7 4
S6 5
S5 6
S4 7
S3 8
S1 9
S2 10
S0 11
GND 12
24 Vcc
23 INHIBIT
22 D
21 C
20 S10
19 S11
18 S8
17 S9
16 S14
15 S15
14 S12
13 S13

INPUTS					OUTPUTS
INHIBIT	A	B	C	D	"H"
L	L	L	L	L	S_0
L	H	L	L	L	S_1
L	L	H	L	L	S_2
L	H	H	L	L	S_3
L	L	L	H	L	S_4
L	H	L	H	L	S_5
L	L	H	H	L	S_6
L	H	H	H	L	S_7
L	L	L	L	H	S_8
L	H	L	L	H	S_9
L	L	H	L	H	S_{10}
L	H	H	L	H	S_{11}
L	L	L	H	H	S_{12}
L	H	L	H	H	S_{13}
L	L	H	H	H	S_{14}
L	H	H	H	H	S_{15}
H	*	*	*	*	ALL OUTPUTS"L"

* :Don't Care


INHIBIT 23
A 2
B 3
C 21
D 22
STROBE 1
ø
ø̄
11 S0
9 S1
10 S2
8 S3
7 S4
6 S5
5 S6
4 S7
18 S8
17 S9
20 S10
19 S11
14 S12
13 S13
16 S14
15 S15

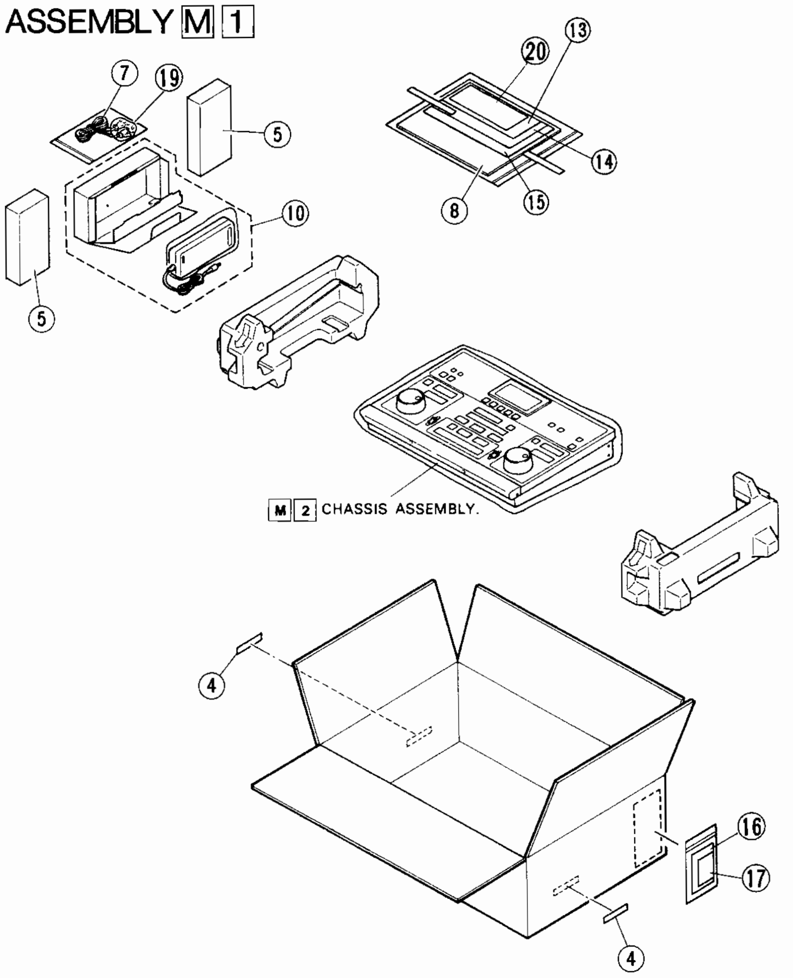
2-14

SECTION 3
EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

3.1 PACKING ASSEMBLY M 1

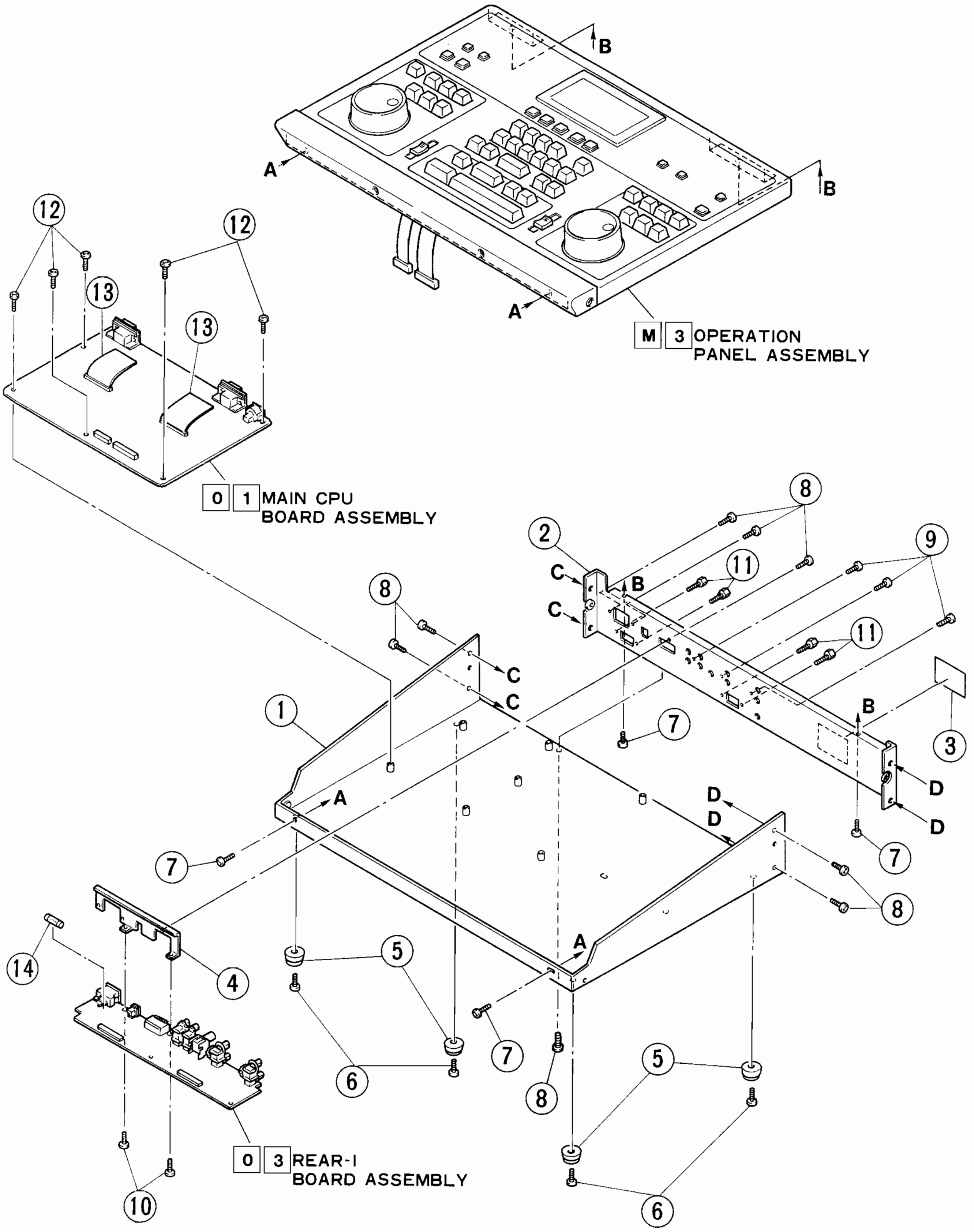


PACKING ASSEMBLY M 1

M 1 M M ☐☐☐☐

⚠ REF No.	PART No.	PART NAME, DESCRIPTION
4	PUP40329	SER.NO.STICKER × 2
5	PRD44358	CUSHION × 2
7	QMP9003-022	POWER CORD
8	SL96025	INSTRUCTION
10	PGZ02062-02	AC ADAPTOR
13	PRD31149	PLATE FOR 10-KEY
14	PRD31150	PLATE FOR MAIN UNIT
15	PRD44732-02	INST SHEET FOR PLATE
16	BT-51008-1	WARRANTY CARD
17	BT-20104A	SERVICE NETWARK
19	PUP40003-7	AIR CAP
20	PU33941-3-3	SAFETY GUIDE

3.2 CHASSIS ASSEMBLY $\boxed{M}\boxed{2}$

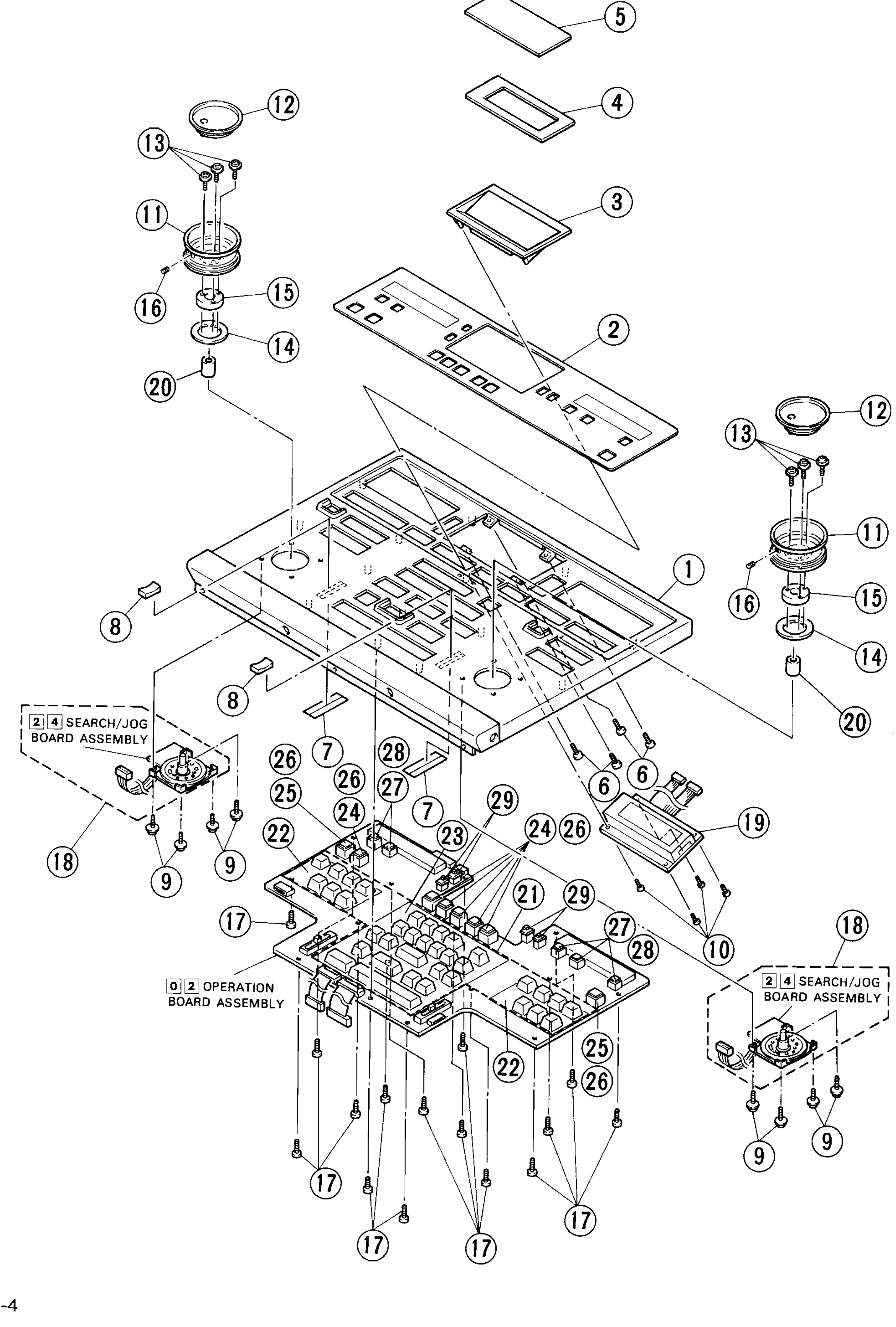

B
B
A
A
M 3 OPERATION
PANEL ASSEMBLY
12
12
13
13
0 1 MAIN CPU
BOARD ASSEMBLY
8
2
C
C
B
11
9
11
8
C
C
1
A
3
B
D
D
D
D
7
7
7
8
14
4
5
6
5
A
7
8
5
6
0 3 REAR-1
BOARD ASSEMBLY
10
6

CHASSIS ASSEMBLY M2

M 2 M M ☐ ☐ ☐ ☐

⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
1	PRD10289C	BOTTOM COVER ASSEMBLY	
2	PRD10291-03	REAR COVER	
3	PRD30087-10-05	RATING LABEL	
4	PRD44352	REAR BRACKET	
5	QZF2207-001	FOOT	× 4
6	SDST3005ZY	SCREW	× 4
7	SDSP3006M	SCREW	× 4
8	SDST3006R	SCREW	× 8
9	SDSF3008R	SCREW	× 3
10	PRD44050	SCREW	× 2
11	PGZ01821	SCREW	× 4
12	SDSP3004N	SCREW	× 5
13	PGW0206-050300	FFC	× 2
⚠ 14	QMF51J1-1R25N	FUSE	

3.3 OPERATION PANEL ASSEMBLY M 3



5
12
4
13
11
3
16
15
2
14
20
12
13
11
1
16
15
8
14
8
20
2 4 SEARCH/JOG BOARD ASSEMBLY
7
26
28
26
27
6
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25
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29
24
22
23
24 26
19
18
9
9
21
29
17
10
27
28
18
0 2 OPERATION BOARD ASSEMBLY
2 4 SEARCH/JOG BOARD ASSEMBLY
25
22
26
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17
17
17
17
17

OPERATION PANEL ASSEMBLY M 3

M 3 M M ☐ ☐ ☐ ☐

⚠ REF No.	PART No.	PART NAME, DESCRIPTION
1	PRD10286C	PANEL ASSEMBLY
2	PRD20523-02-03	WINDOW(2)
3	PRD20521	ESUCTHEON
4	PRD44356	PLATE
5	PRD44347	WINDOW(1)
6	SDSF3006ZY	SCREW × 4
7	PRD44349	SHEET × 4
8	PRD44348	SLIDE KNOB × 2
9	DPSP3016Z	SCREW × 8
10	SDSF2005ZY	SCREW × 4
11	PRD31052A-06	SEARCH KNOB ASSEMBLY × 2
12	PRD41819B-01	JOG KNOB ASSEMBLY × 2
13	DPSP2016Z	SCREW × 6
14	PRD44346	SPACER × 2
15	PRD44134	SPACER, (JOG) × 2
16	YWS3004B	SET SCREW × 2
17	SDSP3004N	SCREW ×15
18	PGS21115A	SEARCH／JOG CONTROL ASSEMBLY × 2
19	PGZ02045	L.C.D.
20	PRD30026-47	COLLAR
21	PGZ01411C	KEY TOP ASSEMBLY
22	PRD44351	BLIND SHEET(1) × 2
23	PRD31053	BLIND SHEET(2)
24	PGZ02057-01	SWITCH KNOB, DARK GRAY × 6
25	PGZ02057-02	SWITCH KNOB, BLUE × 2
26	PGZ02059	SWITCH GUARD, DARK GRAY × 8
27	PGZ02058	SWITCH KNOB, GRAY × 5
28	PGZ02060	SWITCH GUARD, DARK GRAY × 5
29	PRD44020	SWITCH KNOB × 4

SECTION 4
ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS :

RESISTORS-All resistance values are in ohms (Ω), unless otherwise indicated.

k	: 1,000 (Kilo)
M	: 1,000,000 (Mega)
Chip R	: Chip Resistor
Chip VR	: Chip Variable Resistor
Comp. R	: Composition Resistor
CR	: Carbon Film Resistor
FR	: Fusible Resistor
MFR	: Metal Film Resistor
MPR	: Metal Plate Resistor
OMR	: Oxide Metal Film Resistor
PMR	: Precision Metal Film Resistor
UFR	: Unflammable Resistor
VR	: Variable Resistor (Potentiometer)
WR	: Wire Wound Resistor

CAPACITORS-All capacitance values are in μF, unless otherwise indicated.

pF	: μμF (Pico farad)
C Cap	: Ceramic Capacitor
Chip Cap	: Chip Capacitor
Chip T Cap	: Chip Tantalum Capacitor
E Cap	: Electrolytic Capacitor
FM Cap	: Film Mica Capacitor
LL Cap	: Low Leak Current Electrolytic Capacitor
MM Cap	: Metalized Mylar Capacitor
MP Cap	: Metalized Paper Capacitor
MY Cap	: Mylar Capacitor
NP Cap	: Non-polar Capacitor
PC Cap	: Polycarbonate Capacitor
PP Cap	: Polypropylene Capacitor
PS Cap	: Polystyrol Capacitor
T Cap	: Tantalum Capacitor
TF Cap	: Thin Film Capacitor
TR Cap	: Trimmer Capacitor

NOTES :

- [2 digits] indicates circuit board symbol number.
- "X" indicates quantity per set.

01

MAIN CPU BOARD ASSEMBLY <01>

#⚠REF No.	PART No.	PART NAME, DESCRIPTION	
PWBA	SLK1002-01-00A	MAIN CPU BOARD ASSEMBLY	
IC1	TMPZ84C00AP-6	I.C.(M)	TOSHIBA
IC2	TC74HC244AP	I.C.(M)	TOSHIBA
IC3	TC74HC244AP	I.C.(M)	TOSHIBA
IC4	PLSL1011-V1-03	I.C.(M)	M27C512-15F1
IC5	MB84256A-10L	I.C.(M)	FUJITSU
IC6	TC74HC08AP	I.C.(M)	TOSHIBA
IC7	TC74HC139AP	I.C.(M)	TOSHIBA
IC8	TC74HC4078AP	I.C.(M)	TOSHIBA
IC9	DS1210	I.C.(M)	DALLAS
IC10	TC74HC04AP	I.C.(M)	TOSHIBA
IC11	TC74HC4020AP	I.C.(M)	TOSHIBA
IC12	TC74HC32AP	I.C.(M)	TOSHIBA
IC13	TMPZ84C30AP-6	I.C.(M)	TOSHIBA
IC14	TMPZ84C30AP-6	I.C.(M)	TOSHIBA
IC15	TC74HC138AP	I.C.(M)	TOSHIBA
IC16	TMP82C255AN-2	I.C.(M)	TOSHIBA
IC17	TMPZ84C40AP-6	I.C.(M)	TOSHIBA
IC18	TC74HC244AP	I.C.(M	TOSHIBA)
IC19	MC34051P	I.C.(M)	MOTOROLA
IC20	LM1881N	I.C.(M)	NATIONAL SEMIC
IC21	TD62083AP	I.C.(M)	TOSHIBA
IC22	TC74HC74AP	I.C.(M)	TOSHIBA
IC23	TC74HC14AP	I.C.(M)	TOSHIBA
IC24	M51957BL	I.C.(M)	MITUBISHI
IC25	TA78005AP	I.C.(M)	TOSHIBA
D1	V03C-F	DIODE	
D2	TLS124	LED	
R1	QRD161J-103	C.RESISTOR	10K,1/6W
R2	QRD161J-103	C.RESISTOR	10K,1/6W
R3	QRD161J-560	C.RESISTOR	56,1/6W
R4	QRD161J-122	C.RESISTOR	1.2K,1/6W
R5	QRD161J-105	C.RESISTOR	1.0M,1/6W
R6	QRD161J-330	C.RESISTOR	33,1/6W
R7	QRD161J-330	C.RESISTOR	33,1/6W
R8	QRD161J-103	C.RESISTOR	10K,1/6W
R9	QRD161J-103	C.RESISTOR	10K,1/6W
R10	QRD161J-102	C.RESISTOR	1.0K,1/6W
R11	QRD161J-102	C.RESISTOR	1.0K,1/6W
R12	QRD161J-101	C.RESISTOR	100,1/6W
R13	QRD161J-330	C.RESISTOR	33,1/6W
R14	QRD161J-330	C.RESISTOR	33,1/6W
R15	QRD161J-103	C.RESISTOR	10K,1/6W
R16	QRD161J-103	C.RESISTOR	10K,1/6W
R17	QRD161J-102	C.RESISTOR	1.0K,1/6W
R18	QRD161J-102	C.RESISTOR	1.0K,1/6W
R19	QRD161J-101	C.RESISTOR	100,1/6W
R20	QRD161J-101	C.RESISTOR	100,1/6W
R21	QRD161J-101	C.RESISTOR	100,1/6W
R22	QRD161J-101	C.RESISTOR	100,1/6W
R23	QRD161J-101	C.RESISTOR	100,1/6W
R24	QRD161J-101	C.RESISTOR	100,1/6W
R25	QRD161J-684	C.RESISTOR	680K,1/6W
R26	QRD161J-100	C.RESISTOR	10,1/6W
R27	QRD161J-100	C.RESISTOR	10,1/6W
R28	QRD161J-100	C.RESISTOR	10,1/6W
R29	QRD161J-100	C.RESISTOR	10,1/6W
R31	QRD161J-103	C.RESISTOR	10K,1/6W
R32	QRD161J-103	C.RESISTOR	10K,1/6W
R33	QRD161J-103	C.RESISTOR	10K,1/6W
R34	QRD161J-103	C.RESISTOR	10K,1/6W
R35	QRD161J-472	C.RESISTOR	4.7K,1/6W
R36	QRD161J-103	C.RESISTOR	10K,1/6W
R37	QRD161J-103	C.RESISTOR	10K,1/6W
R38	QRD161J-101	C.RESISTOR	100,1/6W
R39	QRD161J-101	C.RESISTOR	100,1/6W
R40	QRD161J-101	C.RESISTOR	100,1/6W
R41	QRD161J-101	C.RESISTOR	100,1/6W
RA1	EXB-P88103M	R ARRAY	
RA2	QRB08AJ-103	R NETWORK	10K
RA3	QRB08AJ-103	R NETWORK	10K
RA4	QRB08AJ-103	R NETWORK	10K
RA5	QRB08AJ-103	R NETWORK	10K
C1	QCT25CH-100	CER.CAPACITOR	10p,50V
C2	QCT25CH-100	CER.CAPACITOR	10p,50V
C3	QFN41HJ-104	MY.CAPACITOR	0.10,50V
C4	QFN41HJ-104	MY.CAPACITOR	0.10,50V
C5	QCF31HP-102	CER.CAPACITOR	1000p,50V
C6	QCF31HP-102	CER.CAPACITOR	1000p,50V
C7	QCF11HP-103	CER.CAPACITOR	0.010,50V
C8	QETA1CM-477	E.CAPACITOR	470,16V
C9	QETA1CM-477	E.CAPACITOR	470,16V
C10	QCF11HP-103	CER.CAPACITOR	0.010,50V
C11	QEJ41CM-476	E.CAPACITOR	47,16V
C12	QEJ41CM-476	E.CAPACITOR	47,16V
C13	QEJ41CM-476	E.CAPACITOR	47,16V
C14	QETA1CM-477	E.CAPACITOR	470,16V
C15	QETA1CM-477	E.CAPACITOR	470,16V
C16	QCF11HP-103	CER.CAPACITOR	0.010,50V
C17	QCF11HP-103	CER.CAPACITOR	0.010,50V
C18	QCF11HP-103	CER.CAPACITOR	0.010,50V
C19	QCF11HP-103	CER.CAPACITOR	0.010,50V
C20	QCF11HP-103	CER.CAPACITOR	0.010,50V
C21	QCF11HP-103	CER.CAPACITOR	0.010,50V
C22	QCF11HP-103	CER.CAPACITOR	0.010,50V
C23	QCF11HP-103	CER.CAPACITOR	0.010,50V
C24	QCF11HP-103	CER.CAPACITOR	0.010,50V
C25	QCF11HP-103	CER.CAPACITOR	0.010,50V
C26	QCF11HP-103	CER.CAPACITOR	0.010,50V
C27	QCF11HP-103	CER.CAPACITOR	0.010,50V
C28	QCF11HP-103	CER.CAPACITOR	0.010,50V
C29	QCF11HP-103	CER.CAPACITOR	0.010,50V
C30	QCF11HP-103	CER.CAPACITOR	0.010,50V

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	C31	QCF11HP-103	CER.CAPACITOR	0.010,50V
	C32	QCF11HP-103	CER.CAPACITOR	0.010,50V
	C33	QCF11HP-103	CER.CAPACITOR	0.010,50V
	C34	QCF11HP-103	CER.CAPACITOR	0.010,50V
	C35	QCF11HP-103	CER.CAPACITOR	0.010,50V
	C36	QCF11HP-103	CER.CAPACITOR	0.010,50V
	C37	QCF11HP-103	CER.CAPACITOR	0.010,50V
	C38	QCF11HP-103	CER.CAPACITOR	0.010,50V
	C39	QETA1CM-477	E.CAPACITOR	470,16V
	C40	QCF11HP-103	CER.CAPACITOR	0.010,50V
	C41	QETA1CM-477	E.CAPACITOR	470,16V
	C42	QCF11HP-103	CER.CAPACITOR	0.010,50V
	C45	QCF11HP-103	CER.CAPACITOR	0.010,50V
	C46	QFN41HJ-103	MY.CAPACITOR	0.010,50V
	C47	QFN41HJ-103	MY.CAPACITOR	0.010,50V
	C48	QCT25CH-101	CER.CAPACITOR	100p,50V
	C50	QCT25CH-101	CER.CAPACITOR	100p,50V
	C51	QCT25CH-101	CER.CAPACITOR	100p,50V
	C52	QCT25CH-101	CER.CAPACITOR	100p,50V
	C53	QCT25CH-101	CER.CAPACITOR	100p,50V
	C54	QCT25CH-101	CER.CAPACITOR	100p,50V
	C55	QCT25CH-101	CER.CAPACITOR	100p,50V
	C56	QCT25CH-101	CER.CAPACITOR	100p,50V
	C57	QCT25CH-101	CER.CAPACITOR	100p,50V
	C58	QCT25CH-101	CER.CAPACITOR	100p,50V
	C59	QCT25CH-101	CER.CAPACITOR	100p,50V
	C60	QCT25CH-101	CER.CAPACITOR	100p,50V
	C61	QCT25CH-101	CER.CAPACITOR	100p,50V
	C62	QCT25CH-101	CER.CAPACITOR	100p,50V
	C63	QCT25CH-101	CER.CAPACITOR	100p,50V
	C64	QCT25CH-101	CER.CAPACITOR	100p,50V
	C65	QCT25CH-101	CER.CAPACITOR	100p,50V
	C66	QCT25CH-101	CER.CAPACITOR	100p,50V
	C67	QCT25CH-101	CER.CAPACITOR	100p,50V
	C68	QCT25CH-101	CER.CAPACITOR	100p,50V
	L1	PGZ00643	CHOKE COIL	
⚠	X1	PGZ01561	CRYSTAL, (9.8304MHz)	
	S1	PGZ00096-104	DIP SWITCH	
⚠	K1	PU60281-2	FERRITE BEADS	
⚠	K2	PU60281-2	FERRITE BEADS	
⚠	K3	PU60281-2	FERRITE BEADS	
⚠	K4	PU60281-2	FERRITE BEADS	
⚠	K5	PU60281-2	FERRITE BEADS	
⚠	K6	PU60281-2	FERRITE BEADS	
⚠	K7	PU60281-2	FERRITE BEADS	
⚠	K8	PU60281-2	FERRITE BEADS	
⚠	K9	PU60281-2	FERRITE BEADS	
⚠	K10	PU60281-2	FERRITE BEADS	
⚠	K11	PU60281-2	FERRITE BEADS	
⚠	K12	PU60281-2	FERRITE BEADS	
⚠	K13	PU60281-2	FERRITE BEADS	
⚠	K14	PU60281-2	FERRITE BEADS	
⚠	K15	PU60281-2	FERRITE BEADS	

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
⚠	K16	PU60281-2	FERRITE BEADS
⚠	K17	PU60281-2	FERRITE BEADS
⚠	K18	PU60281-2	FERRITE BEADS
⚠	K19	PU60281-2	FERRITE BEADS
⚠	K20	PU60281-2	FERRITE BEADS
⚠	K21	PU60281-2	FERRITE BEADS
⚠	VA1	PU49624-2	VARISTOR
⚠	VA2	PU49624-2	VARISTOR
⚠	VA3	PU49624-2	VARISTOR
⚠	VA4	PU49624-2	VARISTOR
⚠	VA5	PU49624-2	VARISTOR
⚠	VA6	PU49624-2	VARISTOR
⚠	VA7	PU49624-2	VARISTOR
⚠	VA8	PU49624-2	VARISTOR
⚠	VA17	PU49624-2	VARISTOR
⚠	VA18	PU49624-2	VARISTOR
⚠	VA19	PU49624-2	VARISTOR
⚠	VA20	PU49624-2	VARISTOR
⚠	VA21	PU49624-2	VARISTOR
⚠	VA22	PU49624-2	VARISTOR
⚠	VA23	PU49624-2	VARISTOR
⚠	VA24	PU49624-2	VARISTOR
⚠	VA25	PU49624-2	VARISTOR
⚠	VA26	PU49624-2	VARISTOR
	J1	PGZ01706	10PIN MINI DIN PLUG
	J2	PGZ02015A	D-SUB CONNECTOR
	J3	PGZ02015A	D-SUB CONNECTOR
	CN1	PU59973-30	FPC CONNECTOR
	CN2	PU59973-30	FPC CONNECTOR
	CN3	SSV2616-S20	CONNECTOR
	CN10	PU53587-2	CONNECTOR
	CN11	SSV2616-S30	CONNECTOR
	BT1	PGZ01707	BATTERY
	BZ1	PGZ00908	BUZZER
	TP1	SQMX001-001	TEST POINT, × 4 (TP1 TO TP4)
⚠	FL1	PGZ01161-223	FILTER
⚠	FL2	PGZ01723-506	FILTER
	SPC1	PRD42240	PAD, FOR BZ1
	SPC2	PRD30083-04	SPACER
	SKT1	PGZ01724-028	IC SOCKET, FOR IC4
	HS1	PRD42610	HEAT SINK, FOR IC25
	SCW1	DPSP3010Z	SCREW, FOR IC25
	SCW2	NNS3000Z	NUT, FOR IC25

02

OPERATION BOARD ASSEMBLY <02>

#⚠REF No.	PART No.	PART NAME, DESCRIPTION	
PWBA	SLK1001-00A	OPERATION BOARD ASSEMBLY	
IC1	TC74HC138AP	I.C.(M)	TOSHIBA
IC2	TC74HC138AP	I.C.(M)	TOSHIBA
IC3	TMP82C79P-2	I.C.(M)	TOSHIBA
IC4	TC74HC541AP	I.C.(M)	TOSHIBA
IC5	TC74HC138AP	I.C.(M)	TOSHIBA
IC6	TC74HC273AP	I.C.(M)	TOSHIBA
IC7	TC74HC273AP	I.C.(M)	TOSHIBA
IC8	TC74HC273AP	I.C.(M)	TOSHIBA
IC9	TC74HC273AP	I.C.(M)	TOSHIBA
IC10	TC74HC4514AP	I.C.(M)	TOSHIBA
IC11	TC74HC240AP	I.C.(M)	TOSHIBA
IC12	TC74HC240AP	I.C.(M)	TOSHIBA
IC13	TC74HC273AP	I.C.(M)	TOSHIBA
IC14	TC74HC273AP	I.C.(M)	TOSHIBA
IC15	TC74HC240AP	I.C.(M)	TOSHIBA
IC16	TC74HC193AP	I.C.(M)	TOSHIBA
IC17	TC74HC193AP	I.C.(M)	TOSHIBA
IC18	MSM5210RS	I.C.(M)	OKI
IC19	TC74HC273AP	I.C.(M)	TOSHIBA
IC20	TC74HC273AP	I.C.(M)	TOSHIBA
IC21	TC74HC240AP	I.C.(M)	TOSHIBA
IC22	TC74HC193AP	I.C.(M)	TOSHIBA
IC23	TC74HC193AP	I.C.(M)	TOSHIBA
IC24	MSM5210RS	I.C.(M)	OKI
IC25	TC74HC00AP	I.C.(M)	TOSHIBA
IC26	TC74HC14AP	I.C.(M)	TOSHIBA
IC27	TC74HC08AP	I.C.(M)	TOSHIBA
IC28	BA618	I.C.(M)	ROHM
IC29	BA618	I.C.(M)	ROHM
IC30	TD62083AP	I.C.(M)	TOSHIBA
IC31	BA618	I.C.(M)	ROHM
IC32	BA618	I.C.(M)	ROHM
IC33	TD62083AP	I.C.(M)	TOSHIBA
D1	1SS133	DIODE	
D2	1SS133	DIODE	
D3	1SS133	DIODE	
D4	1SS133	DIODE	
D5	1SS133	DIODE	
D6	1SS133	DIODE	
D7	1SS133	DIODE	
D8	1SS133	DIODE	
D9	1SS133	DIODE	
D10	1SS133	DIODE	
D11	1SS133	DIODE	
D12	1SS133	DIODE	
D13	1SS133	DIODE	
D14	1SS133	DIODE	
D15	1SS133	DIODE	
D16	1SS133	DIODE	
D17	1SS133	DIODE	
D18	1SS133	DIODE	
D19	1SS133	DIODE	
D20	1SS133	DIODE	
D21	1SS133	DIODE	
D22	1SS133	DIODE	
D23	1SS133	DIODE	
D24	1SS133	DIODE	
D25	1SS133	DIODE	
D26	1SS133	DIODE	
D27	1SS133	DIODE	
D30	1SS133	DIODE	
D31	1SS133	DIODE	
D32	1SS133	DIODE	
D33	1SS133	DIODE	
D39	1SS133	DIODE	
D40	1SS133	DIODE	
D41	1SS133	DIODE	
D42	1SS133	DIODE	
D43	1SS133	DIODE	
D44	1SS133	DIODE	
D45	1SS133	DIODE	
D46	1SS133	DIODE	
D47	1SS133	DIODE	
D48	1SS133	DIODE	
D49	1SS133	DIODE	
D54	1SS133	DIODE	
D55	1SS133	DIODE	
D56	1SS133	DIODE	
D57	1SS133	DIODE	
D58	1SS133	DIODE	
D59	1SS133	DIODE	
D60	1SS133	DIODE	
D101	LB-502VN	LED	
D102	LB-502VN	LED	
D103	LB-502VN	LED	
D104	LB-502VN	LED	
D105	LB-502VN	LED	
D106	LB-502VN	LED	
D107	LB-502VN	LED	
D108	LB-502VN	LED	
D109	SLR-55VC3F	LED	
D110	SLR-55VC3F	LED	
D111	TLS124	LED	
D112	TLS124	LED	
D113	SLR-55VC3F	LED	
D114	SLR-55VC3F	LED	
D115	SLR-55VC3F	LED	
D116	SLR-55MC3F	LED	
D122	SLR-55VC3F	LED	
D123	SLR-55VC3F	LED	
D124	SLR-55VC3F	LED	
D125	SLR-55MC3F	LED	
D126	SLR-55VC3F	LED	

#⚠REF No.	PART No.	PART NAME, DESCRIPTION	
R1	QRD161J-331	C.RESISTOR	330,1／6W
R2	QRD161J-331	C.RESISTOR	330,1／6W
R3	QRD161J-331	C.RESISTOR	330,1／6W
R4	QRD161J-331	C.RESISTOR	330,1／6W
R5	QRD161J-331	C.RESISTOR	330,1／6W
R6	QRD161J-331	C.RESISTOR	330,1／6W
R7	QRD161J-102	C.RESISTOR	1.0K,1／6W
R8	QRD161J-102	C.RESISTOR	1.0K,1／6W
R9	QRD161J-331	C.RESISTOR	330,1／6W
R10	QRD161J-331	C.RESISTOR	330,1／6W
R11	QRD161J-331	C.RESISTOR	330,1／6W
R12	QRD161J-331	C.RESISTOR	330,1／6W
R13	QRD161J-331	C.RESISTOR	330,1／6W
R14	QRD161J-331	C.RESISTOR	330,1／6W
R15	QRD161J-331	C.RESISTOR	330,1／6W
R16	QRD161J-331	C.RESISTOR	330,1／6W
R17	QRD161J-151	C.RESISTOR	150,1／6W
R18	QRD161J-151	C.RESISTOR	150,1／6W
R19	QRD161J-151	C.RESISTOR	150,1／6W
R20	QRD161J-151	C.RESISTOR	150,1／6W
R21	QRD161J-151	C.RESISTOR	150,1／6W
R22	QRD161J-151	C.RESISTOR	150,1／6W
R23	QRD161J-151	C.RESISTOR	150,1／6W
R24	QRD161J-151	C.RESISTOR	150,1／6W
R25	QRD161J-331	C.RESISTOR	330,1／6W
R26	QRD161J-331	C.RESISTOR	330,1／6W
R27	QRD161J-331	C.RESISTOR	330,1／6W
R28	QRD161J-331	C.RESISTOR	330,1／6W
R34	QRD161J-331	C.RESISTOR	330,1／6W
R35	QRD161J-331	C.RESISTOR	330,1／6W
R36	QRD161J-331	C.RESISTOR	330,1／6W
R37	QRD161J-331	C.RESISTOR	330,1／6W
R38	QRD161J-331	C.RESISTOR	330,1／6W
R39	QRD161J-331	C.RESISTOR	330,1／6W
R40	QRD161J-331	C.RESISTOR	330,1／6W
R41	QRD161J-151	C.RESISTOR	150,1／6W
R42	QRD161J-151	C.RESISTOR	150,1／6W
R43	QRD161J-151	C.RESISTOR	150,1／6W
R44	QRD161J-151	C.RESISTOR	150,1／6W
R45	QRD161J-151	C.RESISTOR	150,1／6W
R46	QRD161J-151	C.RESISTOR	150,1／6W
R47	QRD161J-151	C.RESISTOR	150,1／6W
R48	QRD161J-151	C.RESISTOR	150,1／6W
R49	QRD161J-331	C.RESISTOR	330,1／6W
R50	QRD161J-331	C.RESISTOR	330,1／6W
R51	QRD161J-331	C.RESISTOR	330,1／6W
R52	QRD161J-331	C.RESISTOR	330,1／6W
R53	QRD161J-331	C.RESISTOR	330,1／6W
R58	QRD161J-331	C.RESISTOR	330,1／6W
R59	QRD161J-331	C.RESISTOR	330,1／6W
R60	QRD161J-331	C.RESISTOR	330,1／6W
R61	QRD161J-331	C.RESISTOR	330,1／6W
R62	QRD161J-331	C.RESISTOR	330,1／6W
R63	QRD161J-331	C.RESISTOR	330,1／6W
R64	QRD161J-331	C.RESISTOR	330,1／6W
R65	QRD161J-103	C.RESISTOR	10K,1／6W
R66	QRD161J-103	C.RESISTOR	10K,1／6W

#⚠REF No.	PART No.	PART NAME, DESCRIPTION	
R67	QRD161J-103	C.RESISTOR	10K,1／6W
R68	QRD161J-103	C.RESISTOR	10K,1／6W
R69	QRX016J-3R9	M.F.RESISTOR	3.9,1W
R70	QRD161J-104	C.RESISTOR	100K,1／6W
R72	QRD161J-0R0	C.RESISTOR	0,1／6W
VR1	PGZ02046	SLIDE VR	
VR2	PGZ02046	SLIDE VR	
RA1	QRB085J-103	RESISTOR ARRAY	10K
RA3	QRB085J-103	RESISTOR ARRAY	10K
RA4	QRB085J-103	RESISTOR ARRAY	10K
C1	QCS31HJ-820	CER.CAPACITOR	82p,50V
C2	QCS31HJ-820	CER.CAPACITOR	82p,50V
C3	QCC11CJ-104	CER.CAPACITOR	0.10,16V
C4	QCF11HP-103	CER.CAPACITOR	0.010,50V
C5	QCF11HP-103	CER.CAPACITOR	0.010,50V
C6	QCF11HP-103	CER.CAPACITOR	0.010,50V
C7	QCF11HP-103	CER.CAPACITOR	0.010,50V
C8	QCF11HP-103	CER.CAPACITOR	0.010,50V
C9	QCF11HP-103	CER.CAPACITOR	0.010,50V
C10	QCF11HP-103	CER.CAPACITOR	0.010,50V
C11	QCF11HP-103	CER.CAPACITOR	0.010,50V
C12	QCF11HP-103	CER.CAPACITOR	0.010,50V
C13	QCF11HP-103	CER.CAPACITOR	0.010,50V
C14	QCF11HP-103	CER.CAPACITOR	0.010,50V
C15	QCF11HP-103	CER.CAPACITOR	0.010,50V
C16	QCF11HP-103	CER.CAPACITOR	0.010,50V
C17	QCF11HP-103	CER.CAPACITOR	0.010,50V
C18	QCF11HP-103	CER.CAPACITOR	0.010,50V
C19	QCF11HP-103	CER.CAPACITOR	0.010,50V
C20	QCF11HP-103	CER.CAPACITOR	0.010,50V
C21	QCF11HP-103	CER.CAPACITOR	0.010,50V
C22	QCF11HP-103	CER.CAPACITOR	0.010,50V
C23	QCF11HP-103	CER.CAPACITOR	0.010,50V
C24	QCF11HP-103	CER.CAPACITOR	0.010,50V
C25	QCF11HP-103	CER.CAPACITOR	0.010,50V
C26	QCF11HP-103	CER.CAPACITOR	0.010,50V
C27	QCF11HP-103	CER.CAPACITOR	0.010,50V
C28	QCF11HP-103	CER.CAPACITOR	0.010,50V
C29	QCF11HP-103	CER.CAPACITOR	0.010,50V
C30	QCF11HP-103	CER.CAPACITOR	0.010,50V
C33	QCF11HP-103	CER.CAPACITOR	0.010,50V
C34	QCF11HP-103	CER.CAPACITOR	0.010,50V
C35	QCF11HP-103	CER.CAPACITOR	0.010,50V
C36	QCF11HP-103	CER.CAPACITOR	0.010,50V
C37	QCF11HP-103	CER.CAPACITOR	0.010,50V
C38	QCF11HP-103	CER.CAPACITOR	0.010,50V
C39	QCF11HP-103	CER.CAPACITOR	0.010,50V
C40	QCF11HP-103	CER.CAPACITOR	0.010,50V
C41	QER41CM-107	E.CAPACITOR	100,16V
C42	QER41CM-107	E.CAPACITOR	100,16V
C43	QER41CM-107	E.CAPACITOR	100,16V
C44	QER41CM-107	E.CAPACITOR	100,16V

#⚠REF No.	PART No.	PART NAME, DESCRIPTION	
C45	QER41CM-107	E.CAPACITOR	100,16V
C46	QER41CM-107	E.CAPACITOR	100,16V
C47	QER41CM-107	E.CAPACITOR	100,16V
C48	QER41CM-107	E.CAPACITOR	100,16V
C49	QCS31HJ-471	CER.CAPACITOR	470p,50V
C50	QCS11HJ-471	CER.CAPACITOR	470p,50V
S1	PGZ02031	PUSH SWITCH	
S2	PGZ02030	PUSH SWITCH	
S3	PGZ02030	PUSH SWITCH	
S4	PGZ02031	PUSH SWITCH	
S5	PGZ02030	PUSH SWITCH	
S6	PGZ02030	PUSH SWITCH	
S7	PGZ02031	PUSH SWITCH	
S8	PGZ02031	PUSH SWITCH	
S9	PGZ02031	PUSH SWITCH	
S10	PGZ02031	PUSH SWITCH	
S11	PGZ02031	PUSH SWITCH	
S12	PGZ02030	PUSH SWITCH	
S13	PGZ02031	PUSH SWITCH	
S14	PGZ02031	PUSH SWITCH	
S15	PGZ02031	PUSH SWITCH	
S16	PGZ02030	PUSH SWITCH	
S17	PGZ02030	PUSH SWITCH	
S18	PGZ02030	PUSH SWITCH	
S19	PGZ02030	PUSH SWITCH	
S20	PGZ02030	PUSH SWITCH	
S21	PGZ02030	PUSH SWITCH	
S22	PGZ02030	PUSH SWITCH	
S23	PGZ02029	PUSH SWITCH	
S24	PGZ02029	PUSH SWITCH	
S25	PGZ02029	PUSH SWITCH	
S26	PGZ02029	PUSH SWITCH	
S27	PGZ02029	PUSH SWITCH	
S30	PGZ02029	PUSH SWITCH	
S31	PGZ02029	PUSH SWITCH	
S32	PGZ02029	PUSH SWITCH	
S33	PGZ02029	PUSH SWITCH	
S39	PGZ02030	PUSH SWITCH	
S40	PGZ02030	PUSH SWITCH	
S41	PGZ02030	PUSH SWITCH	
S42	PGZ02030	PUSH SWITCH	
S43	PGZ02030	PUSH SWITCH	
S44	PGZ02030	PUSH SWITCH	
S45	PGZ02030	PUSH SWITCH	
S46	PGZ02029	PUSH SWITCH	
S47	PGZ02029	PUSH SWITCH	
S48	PGZ02029	PUSH SWITCH	
S49	PGZ02029	PUSH SWITCH	
S54	PGZ02030	PUSH SWITCH	
S55	PGZ02030	PUSH SWITCH	
S56	PGZ02030	PUSH SWITCH	
S57	PGZ02030	PUSH SWITCH	
S58	PGZ02030	PUSH SWITCH	
S59	PGZ02030	PUSH SWITCH	
S60	PGZ02030	PUSH SWITCH	
S61	PGZ01454	SLIDE SWITCH	
S62	PGZ01454	SLIDE SWITCH	
S65	PGZ01454	SLIDE SWITCH	
S66	PGZ01478	SLIDE SWITCH	
CN1	SSV2616-L20	CONNECTOR	
CN2	PU58844-106	CONNECTOR	
CN3	PU58844-110	CONNECTOR	
CN4	PU58844-109	CONNECTOR	
CN5	PU58844-109	CONNECTOR	
CN6	SSV2616-L30	CONNECTOR	
HD1	PQM30038-3	LED HOLDER, FOR D111, D112	× 2
SLD1	PRD42674	SHIELD PLATE	

REAR-1 BOARD ASSEMBLY <03>

#⚠REF No.	PART No.	PART NAME, DESCRIPTION	
PWBA	SLK1002-02-00A	REAR-1 BOARD ASSEMBLY	
D1	RD10ES	Z.DIODE	
D2	RD10ES	Z.DIODE	
D3	RD10ES	Z.DIODE	
D4	RD10ES	Z.DIODE	
D5	RD10ES	Z.DIODE	
D6	RD10ES	Z.DIODE	
D7	RD10ES	Z.DIODE	
D8	RD10ES	Z.DIODE	
R1	QRD161J-750	C.RESISTOR	75,1/6W
S1	QSL0015-L08	DIP SWITCH	
S2	PGZ02048	POWER SWITCH	
J1	PGZ02049	PIN JACK (2PIN)	
J2	PGZ02049	PIN JACK (2PIN)	
J3	PGZ02047	POWER JACK	
J4	PGZ01452	BNC CONNECTOR	
J5	PGZ02050	PIN JACK (4PIN)	
CN1	PU60711-130	CONNECTOR	
CN2	PU60711-130	CONNECTOR	
TP1	SQMX001-001	TEST POINT	
TP2	SQMX001-001	TEST POINT	
DA1	DAN401	DIODE ARRAYS	
DA2	DAN401	DIODE ARRAYS	

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
⚠	HD1	SSV2497-001	FUSE HOLDER
⚠	HD2	SSV2497-001	FUSE HOLDER
⚠	K1	PU60281-2	FERRITE BEADS
⚠	K2	PU60281-2	FERRITE BEADS
⚠	K3	PU60281-2	FERRITE BEADS
⚠	K4	PU60281-2	FERRITE BEADS
⚠	K5	PU60281-2	FERRITE BEADS
⚠	K6	PU60281-2	FERRITE BEADS
⚠	K7	PU60281-2	FERRITE BEADS
⚠	K8	PU60281-2	FERRITE BEADS
⚠	K9	PU60281-2	FERRITE BEADS
⚠	K10	PU60281-2	FERRITE BEADS
⚠	K11	PU60281-2	FERRITE BEADS
⚠	K12	PU60281-2	FERRITE BEADS
⚠	K13	PU60281-2	FERRITE BEADS
⚠	VA1	PU49624-2	VARISTOR
⚠	VA2	PU49624-2	VARISTOR
⚠	VA3	PU49624-2	VARISTOR
⚠	VA4	PU49624-2	VARISTOR
⚠	VA5	PU49624-2	VARISTOR
⚠	VA6	PU49624-2	VARISTOR

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION

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